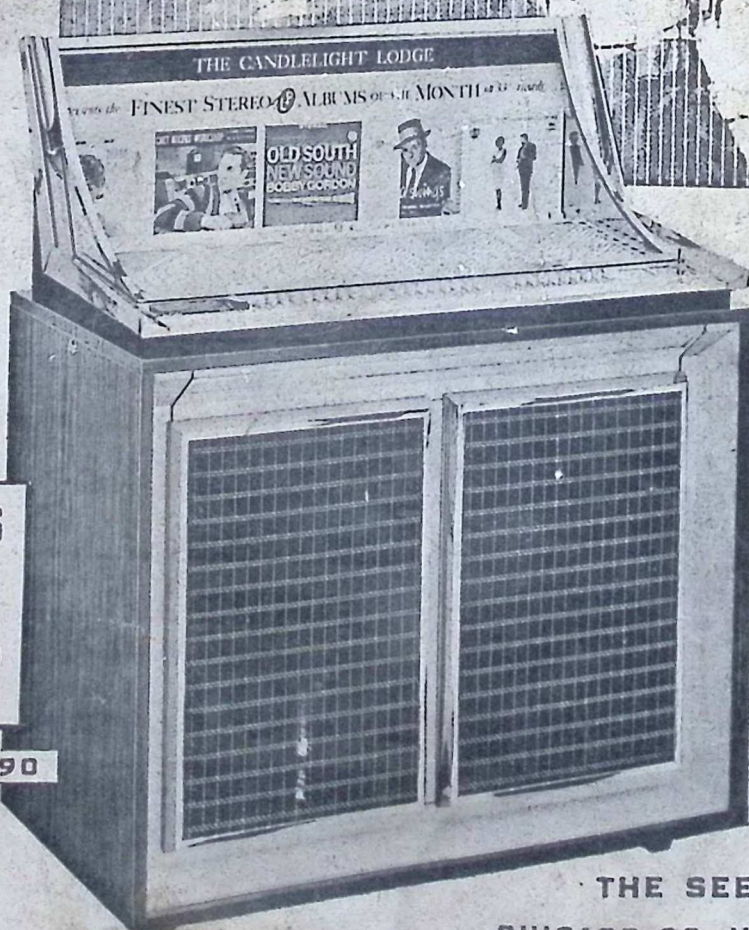


SEEBURG LP CONSOLE

INSTALLATION & OPERATION MANUAL



MODELS
LPC1
LPC1R

PART NO. 487390

THE SEEBURG CORPORATION
CHICAGO 22, ILLINOIS, U.S.A.

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INSTALLATION AND OPERATION

DESCRIPTION

The Select-O-Matic LPC1 Model is a coin operated phonograph designed for selective playing of any of the selections in a program of 80, 33-1/3 r.p.m. and 45 r.p.m., 7-inch diameter records. It will play either side of the records in Single Play Operation or with but one selection, both sides in Album Play. The Album Play feature provides for the playing of both sides of a record - left side first, then the right side - if either the left or right side has been selected. Single Play is conventional operation in which only the selected side of a record is played.

The LPC1 model phonograph is equipped with a fully transistorized stereo amplifier for stereophonic sound reproduction but monaural records may also be used.

Model LPC1R incorporates remote control facilities which permit the use of Seeburg Stereo Consolette, Type SC1 for remote selection and local reproduction of musical programs.

Both the LPC1 and LPC1R Models have a Type APU1, Album Pricing Unit which provides extreme flexibility in setting-up pricing combinations as detailed on Pages 5 and 7.

Model LPC1 contains a Type IT1 Income Totalizer which totals nickels, dimes, quarters and half dollars deposited in the phonograph and indicates actual total cash value. Model LPC1R is equipped with a Type IT1R-56, Income Totalizer which is designed to indicate total cash deposited in both the phonograph and all remote Stereo Consolettes.

INSTALLATION

Damage Caused By Shipping

Examine the instrument immediately after unpacking. If any damage is found, notify the transportation representative.

Cabinet Lid Support

The lid support rod is normally retained in horizontal position and snapped in place as shown dotted in Figure 1. To support the cabinet lid, unsnap the lid support rod, swing into position and hook stud into keyhole slot in latch plate.

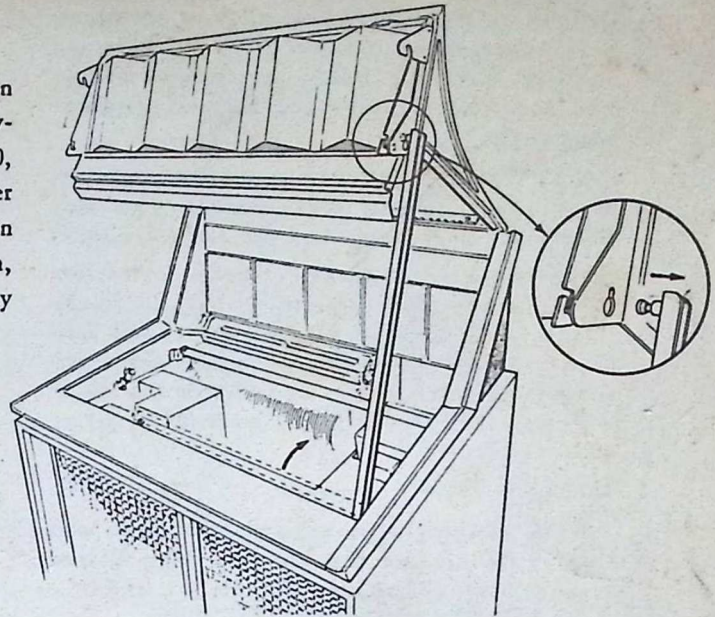


Figure 1. Cabinet Lid Support.

CAUTION: Be certain that the support rod is fully engaged in the slot before the lid is released. Do not move the cabinet while the lid is resting on the support.

Opening Front Doors

The cabinet door Latch Rod Handle is located behind the selector panel as shown in Figure 2. Turn the handle to disengage it from its retaining clips and lift upwards to release the right hand cabinet door. Swing the door open. Unlatch the left hand door at its lower right hand corner and swing out.

NOTE: When closing doors, apply pressure!

The entire lower cabinet compartment containing all electronic units and interconnecting cables is now exposed for unblocking and servicing operations.

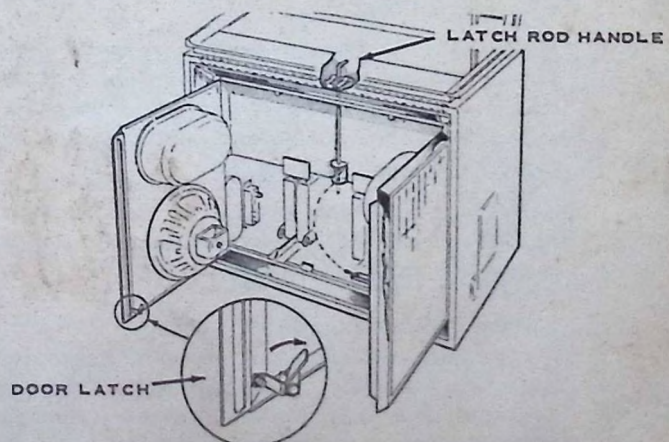


Figure 2. Opening Front Doors.

Unblocking

Before placing this phonograph in operation, it is necessary to remove or loosen shipping hardware. Carefully follow instructions on the tags and remove blocks and shipping supports accordingly.

CAUTION: Do not attempt mechanism operation by manually turning the flywheel; this may damage the mechanism. Use the service switch.

NOTE: Do not put packing blocks, instruction cards, or any other material on the air intake screen in the floor of the cabinet, as this will obstruct ventilation and cause overheating. Overheating will warp records and shorten the life of the equipment. Store blocking material for future use.

Tubes and Plugs

This instrument is shipped with tubes and plugs installed. See that they are firmly seated in the sockets before inserting the line cord.

Voltage Rating

Before connecting the line cord make certain that the voltage and frequency are correct. Although this equipment is designed for 117 volt operation, it will perform satisfactorily at any line voltage between 100 and 130 volts.

CAUTION: In locations where the line voltage exceeds 130 volts, voltage regulator, Seeburg Type VR1-56, is required for protection of the amplifier.

However, this Voltage Regulator will not protect other electrical parts and assemblies in case of prolonged operation (in excess of 1 hour) above 130 volts.

For 220 Volt operation use auto-transformer, Seeburg Part No. 402399.

Placing the Select-O-Matic

To obtain best performance and long service from this equipment, it should be placed on a firm, reasonably level floor, away from excessive moisture and heat.

WARNING: To prevent warping records, place phonograph where the records will not at any time be exposed to direct sunlight or any other radiant heat. Do not reduce ventilation by obstructing the vent screens.

A space of at least two inches must be allowed between the back of the cabinet and the wall, to assure adequate ventilation.

Service Switch Operation

The Service Switch and Manual Credit Switch Assembly (together with the Album Selector Terminal Board) is mounted on the right hand side of the upper cabinet, to the right of the mechanism as shown in Figure 3.

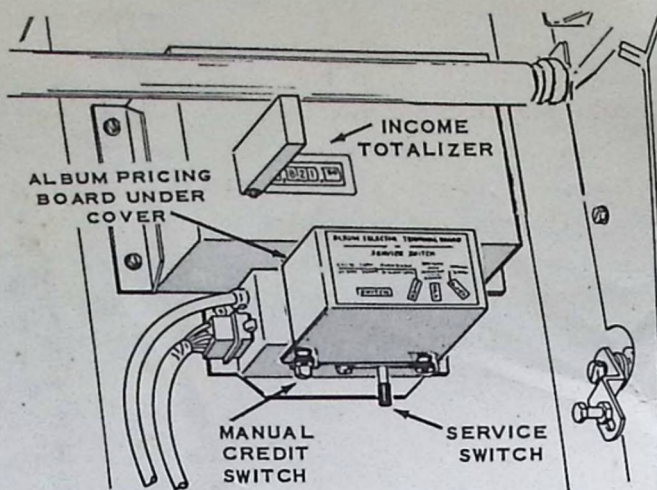


Figure 3. Service Switch & Manual Credit Switch.

When the service switch lever (right of the two switches) is moved to the "SCAN" position (to the left against the spring return) and is permitted to return to the center position, the record playing mechanism will scan past selections previously established, then return and come to rest at the left hand end of the base.

With the mechanism scanning and the service switch in the center position, the mechanism may be stopped at any point of travel by pushing the Manual Credit Switch (left switch) twice to the right.

The service switch must be set to the right of center position for normal operation of the phonograph.

Manual Credit Switch

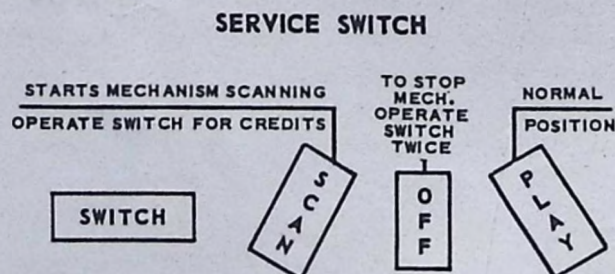


Figure 4. Service Switch Operating Instruction Plate.

With the Service Switch held in "SCAN" position, a credit is obtained when the Manual Credit Switch is pushed to the right, and a selection may be made after the Service Switch is returned to "PLAY" position.

Loading Records

To obtain optimum performance it is necessary that only new or nearly new records be used. Use only standard 7-inch commercial records.

Push up the Main Switch (on left side of cabinet rear) to the "ON" position. Scan the carriage to the right hand end of its base and stop it there as described in Service Switch Operation.

Starting at the left end of the magazine, insert one record in each record space. The Record Playing Indicator refers to the left sides of the records regardless of whether the the left side or the right side selection is being played. *Note that the first twenty (20) record spaces at the left end of the magazine are intended for Album records.*

In the LPC1 and LPC1R Models, A1, C1, E1, G1, etc. will be left sides of records and B1, D1, F1, H1, etc. will be right sides of records.

CAUTION: Do not force records into record spaces! Any normal record will roll very freely into the record space. A record which is warped badly enough to have a tendency to bind in the magazine space would not be properly played in any automatic mechanism and should not be used.

When the left half of the magazine has been loaded, scan the carriage to the left and load the right half of the magazine. After the carriage has been loaded, set the Service Switch to the "PLAY" position (to the right).

CAUTION: Occasionally records will be found that have an undersized center hole. In some cases, this is caused by the paper label which has been pushed into the center hole. An undersized record center hole may make the record stick on the record pin.

Loading Program Holders

The program holders are retained in a five-unit assembly which is hinged on to the cabinet lid. To release the assembly for insertion of program strips, push inwards on the retaining latches, *Figure 5a*, and swing down as shown in *Figure 5b*. The entire unit may be unhooked from the lid to facilitate servicing as shown in *Figure 5c*.

CAUTION: Make certain that Program Holder Assembly is **POSITIVELY LATCHED** after being returned to normal display position. Neglecting to do so may cause jamming of cabinet lid when closed.

A supply of Duplex 33-1/3 Stereo Title Strips, Part No. 484745, will be found in the phonograph cash bag. Album Title Strips, applied at the head of each program holder section, are supplied with each album programmed.

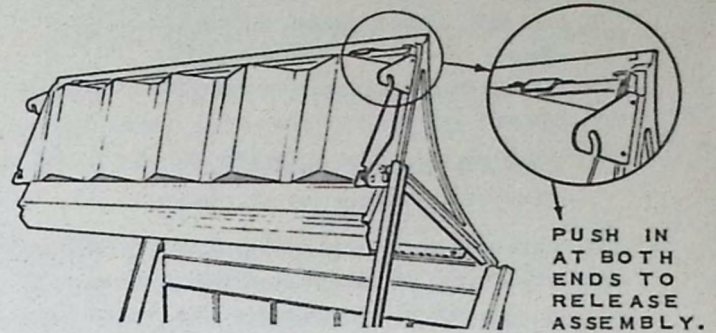


Figure 5a.

Releasing Program Holders.

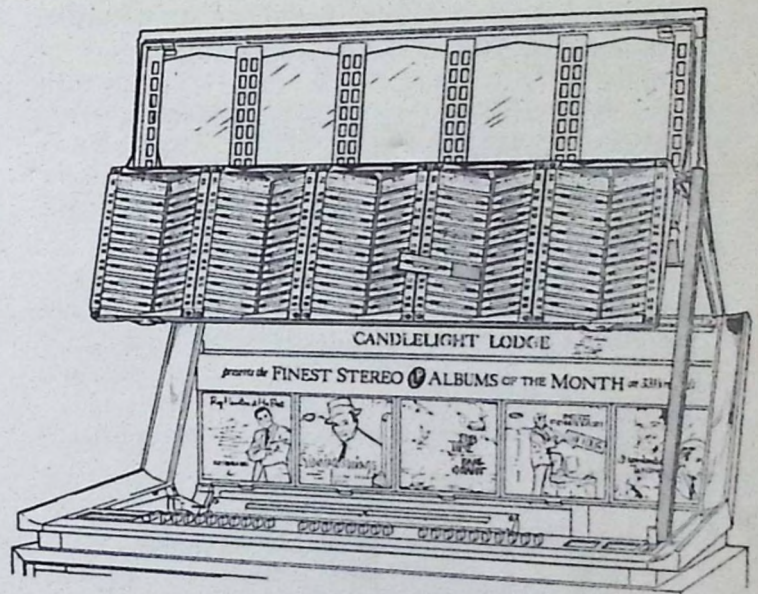


Figure 5b.

Loading Program Holders.

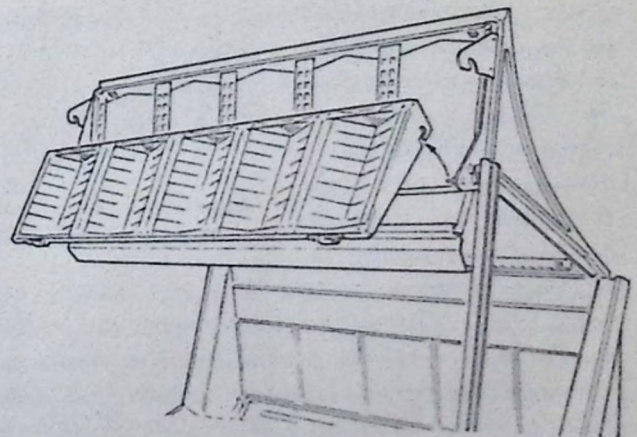


Figure 5c.

Removal of Program Holder Assembly.

Albums Of The Month

"The Albums of The Month" record package consists of the following items:

- A. One (1) 33-1/3 r.p.m. stereo 7-inch record, recorded by one artist.
- B. One (1) lithographed colored album record jacket with appropriate display of featured artist.
- C. Five (5) printed plastic L.P. album title strips for the record.
- D. Three (3) lithographed L.P. miniature facsimiles of the album record jacket to be used on the remote Seeburg Stereo Consolettes.

Album Jacket Installation

Five album holders are located behind the upper lid glass to display the album record jackets listed in "B" of the record package.



Figure 6a. Removal of Jacket Frame.

Push holder up against album holder retainer spring and lift out as shown in Figure 6a. Remove records from the album jacket and insert two (2) jackets -- back to back as shown in Figure 6b. Replace loaded album holder in lid frame making certain that lip latches securely. Note that album holders are reversible so that either album jacket may be displayed by merely removing, turning around and re-installing.

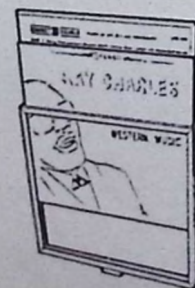


Figure 6b. Insertion of Album Jacket

Insert the L.P. Album Title Strips supplied with the record package as described in previous

section headed "Loading Program Holders".

Location Display Sign

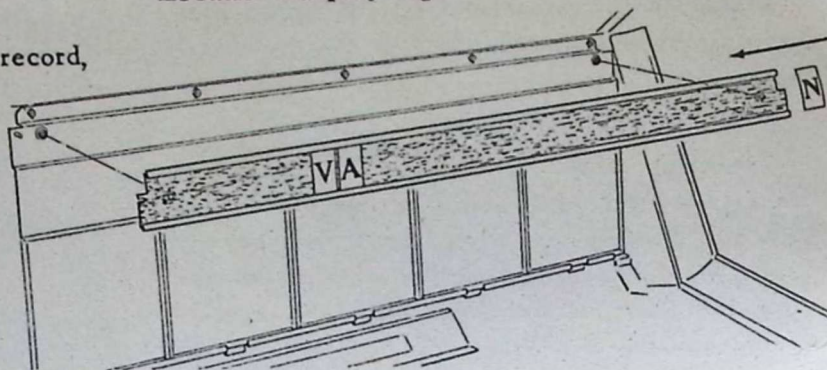


Figure 7. Display Sign Installation.

The LPC Phonograph Models feature an illuminated display panel which may be used to identify the location. The panel frame assembly is located under the lid glass above the album jacket holders.

Letters, numbers, spacers, etc. required to make up the sign are available from your Seeburg distributor under Part No. 509072, Type ACK-2 Alphabet Case Kit.

Carefully unsnap both ends of the nameplate frame as shown in Figure 7. Slide letters into position making certain that all characters are close together, on the same plane and that the completed display is centered. Replace the entire Display Sign Assembly in the phonograph.

POPULARITY METER

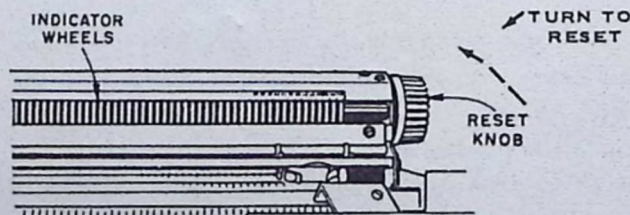


Figure 8. Popularity Meter.

The popularity meter indicates the number of times (up to forty) each record has been played.

The Popularity Reset Knob is located at the right end of the Popularity Meter. To reset turn the knob in a clockwise direction; continue turning until all the wheels indicate zero.

ALBUM PROGRAMMING

The LPC phonograph is prepared at the factory to program twenty (20) Album records in the first twenty (20) record spaces at the left end of the magazine. This includes selections A1, C1, E1 etc. through U2. Only one selection is necessary to play both sides of an "Album" record. For example: if either C1 or D1 is selec-

ted, both sides of the record will be played automatically - left side first.

Additional groups may be set for Album Play as noted below.

ELECTRICAL SELECTOR PRICING TABS

Removal of the Electrical Selector Cover exposes the Pricing Treadle Bar, Figure 9a, to which are attached eight (8) Pricing Tabs. The tab which corresponds to the required number group is placed in position "A", Figure 9b. Tabs 1 and 2 are permanently set for "Album Play".

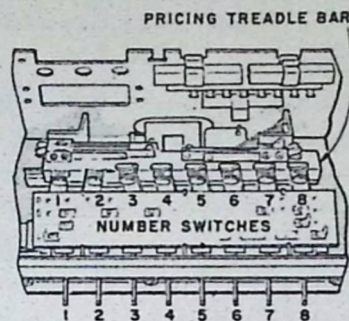


Figure 9a.
Pricing Tab Location.

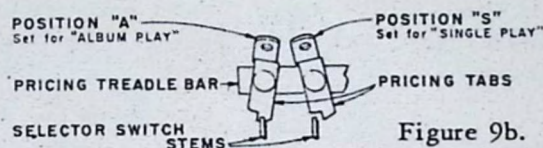


Figure 9b.
Pricing Tab Setting.

ALBUM SELECTOR TERMINAL BOARD

Loosen—do not remove two (2) thumb nuts to release the album terminal board cover, Figure 3. The taper tab corresponding to the number group Figure 10, is connected for Album Play and conforms to the Pricing Tab set-up on the Electrical Selector. *NOTE: Taper tabs 1 and 2 are permanently soldered in place for "Album Play".*

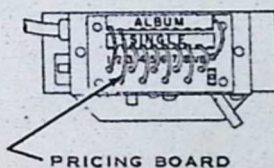


Figure 10.

COMPLETE ALBUM PROGRAMMING

For complete Album Programming of the LPC Phonograph, refer to Album Programming Instruction Sheet, Part No. 487585. It illustrates and details requirements involving adjustments of the APU1 and associated Program Identification Label, Coin and Credit Windows and Pricing Windows.

PRICING WINDOW KIT (25¢ and 50¢ only)

The Pricing Window Kit, Part No. 509140, makes it possible to set up the slug rejector for quarter or half dollar play only. Nickels and dimes deposited are automatically returned. A new Pricing Window and Coin and Credit Window are included in the kit which is available from your Seeburg Distributor.

COIN LOCKOUT SOLENOID

The Coin Lockout Solenoid is energized and coins are locked out during Album subtract motor operation only.

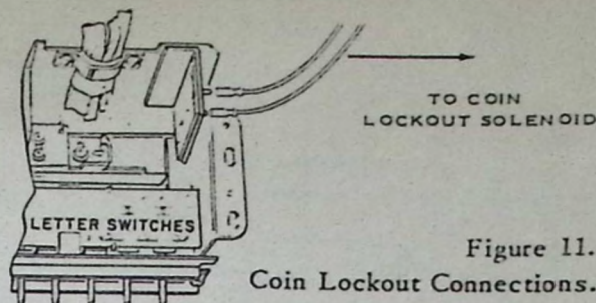


Figure 11.
Coin Lockout Connections.

CAUTION: Coin Lockout Circuit must never be left completely disconnected as this could result in damage to the pricing unit or the wrong selection.

KEY RELEASE BUTTON

If a number button is pressed before a letter button and it is desired to switch to another number, press the Key Release Button (located on the selector panel). This will unlatch the selector key and permit a new number selection.

ALBUM PRICING UNIT, Type APU1

The Album Pricing Unit is designed for use with the LPC1 and LPC1R Model Select-O-Matic phonographs. It exemplifies the ultimate in accumulative credit units and is capable of extreme flexibility in setting up pricing combinations and Album programming.

The value in mixed coins that can be accumulated is dependent upon premiums given for Quarters and Half Dollars. Example of accumulated value is shown below for pricing combinations of:

5¢ play, 6 for Quarter, 12 for Half Dollar or 10¢ play, 3 for Quarter, 6 for Half Dollar.

\$1.50 for combination of Nickels and Dimes;
\$1.25 for 5 Quarters;
\$1.30 for 2 Half Dollars and 6 Nickels (or 3 Dimes); \$1.35 for 1 Half Dollar, 1 Quarter and any combination of Nickels and Dimes totalling 60¢.

Figure 15 constitutes a chart condensing information regarding the capabilities and set-up requirements for seven (7) popular pricing combinations. Lithographed pricing windows, Part Numbers 487569, 487571 and 487574 are supplied with the phonograph. Part Numbers 487570, 487572, 487573 and 487575 are available from your Seeburg Distributor.

Installation

The pricing information window is located at the left end of the phonograph Selector Key Panel. To gain access to the pricing window, open the cabinet doors. Unscrew two (2) retaining screws and remove the pricing window bracket. Install the pricing window transparency selected on the underside of the clear glass window. Adjust the Album Pricing Unit as indicated in the chart and illustrated in Adjustments on Page 8.

ALBUM PRICING UNIT ADJUSTMENTS

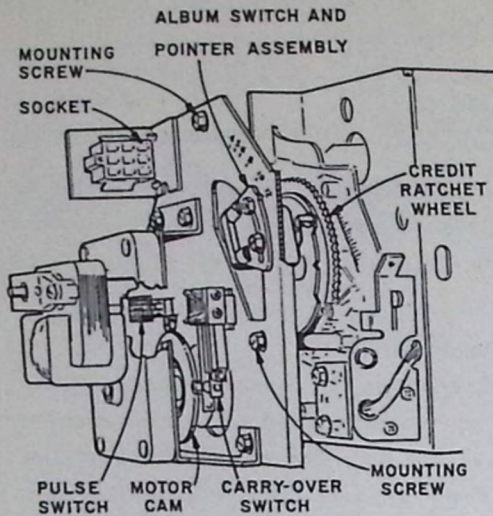


Figure 12. Pricing Unit Identification.

Remove the motor panel before proceeding with price change adjustments. Loosen screw No. 1, remove screw No. 2, loosen screw No. 3 and turn latch to the left as shown in Figure 13. Unplug the motor panel assembly and remove from the lower chassis deck.

CAUTION: When reassembling, make certain that the teeth of Driver and Credit Ratchet Wheel mesh freely. One revolution of driver in "Out" position must remove ten (10) credits and over-drive from 1/64 inch minimum to 1/2 tooth maximum.

Final Adjustment On Album Switch

Starting with "ZERO" credits, manually put on the required number of credits for an "Album Selection". Move pointer to corresponding number on the plate, adjust pointer to left or right until album light is just "ON". Manually remove 1 credit - - - Album light is just "OFF". eg: if albums are a half-dollar, put on 12 CREDITS, move pointer to number 12 on the plate and check light operation.

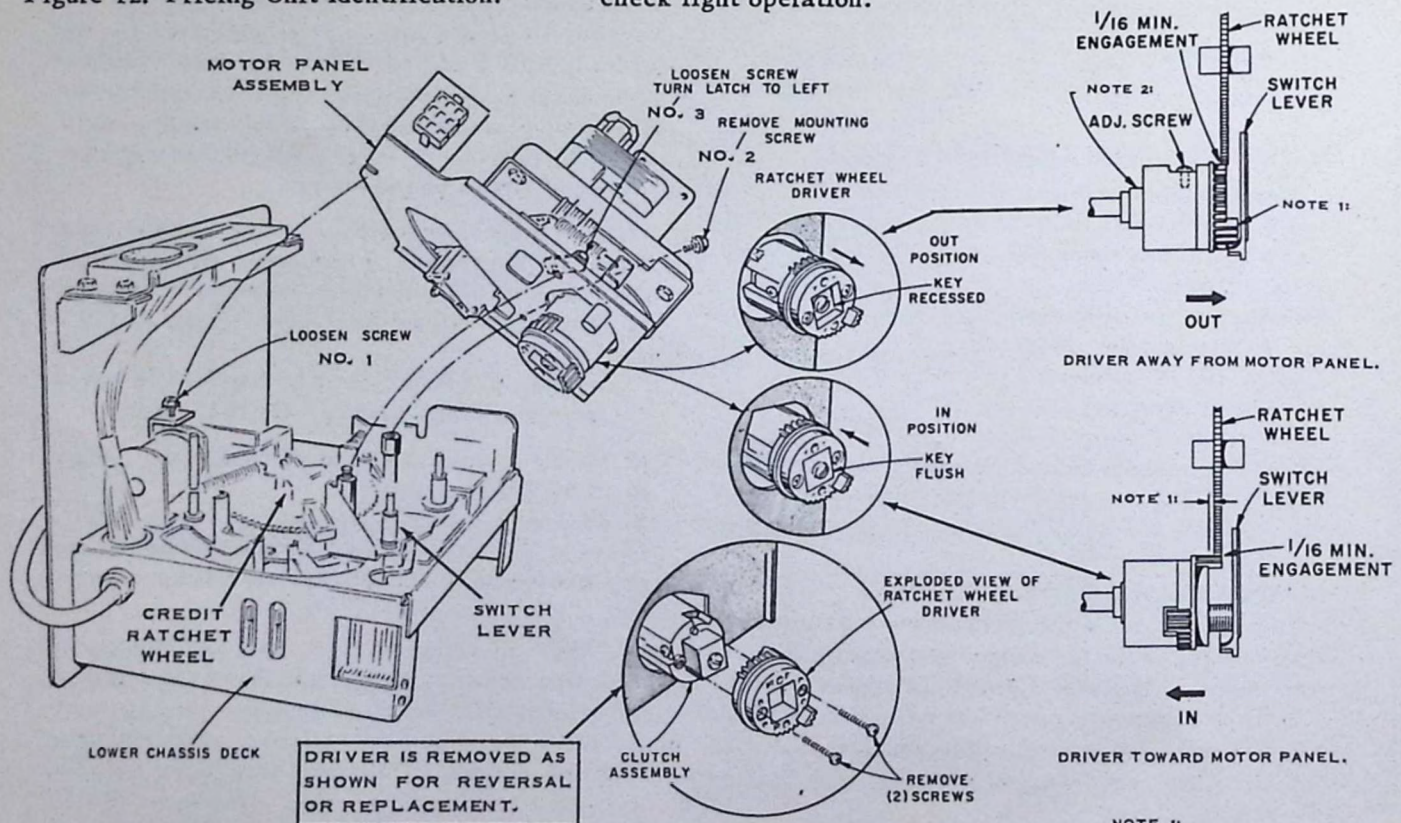


Figure 13. Motor Panel Disassembly

Driver Adjustment

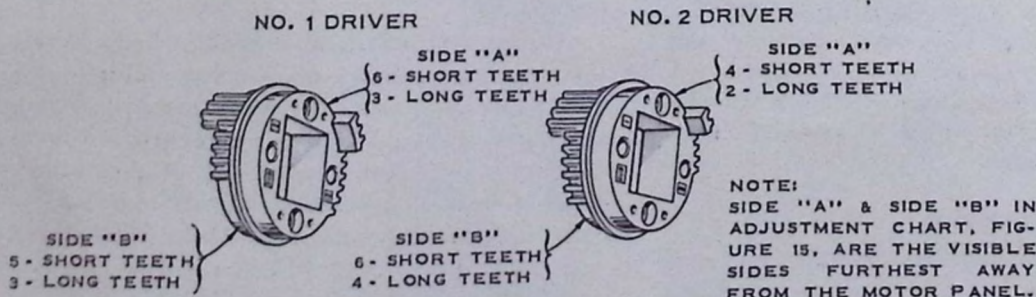
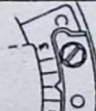
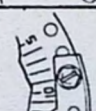
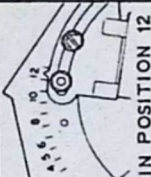
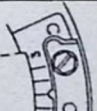
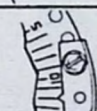
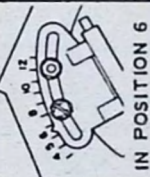
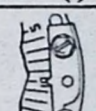
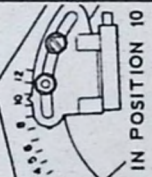
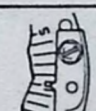
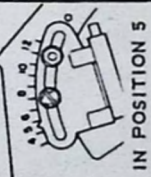
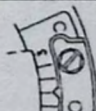
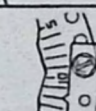
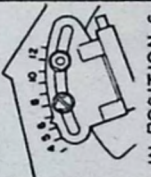
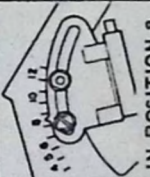
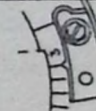
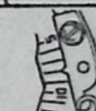
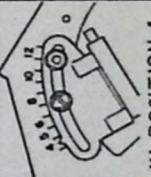


Figure 14. Ratchet Wheel Driver Identification.

NOTE 1:
TO POSITION DRIVER ON PRICING UNITS NOT EQUIPPED WITH BALL DETENT; (1) LOOSEN ADJUSTING SCREW, (2) POSITION DRIVER, (3) TIGHTEN ADJUSTING SCREW. MAKE CERTAIN THAT THERE IS 1/16 INCH MINIMUM ENGAGEMENT BETWEEN GEARS AND THAT NO INTERFERENCE OR RUBBING EXISTS.

NOTE 2:
ADJUSTING SCREW MUST BE AGAINST CLUTCH KEY SURFACE HAVING TWO "DIMPLES" OR IS COLORED.

Figure 15. Album Pricing Unit Adjustment Chart.

PART NO.	PRICING WINDOW singles: 10¢ per selection QUARTER 3 selections HALF DOLLAR 6 selections P albums: < BLUE TITLE STRIPS > HALF DOLLAR 2 QUARTERS per album	ADD STOP POSITIONS			ALBUM SWITCH POINTER POSITION	ZERO STOP	SUBTRACT PAWL	SLUG REJECTOR	PRICING UNIT AND INCOME TOTALIZER JUMPERS	** RATCHET WHEEL DRIVER POSITION
		DIME	QUARTER	HALF DOLLAR						
487569		 IN POSITION 2	 IN POSITION 6	 IN POSITION 12	 IN POSITION 12	POSITION 1	POSITION 2	POSITION 1	POSITION 1	DRIVER NO. 1 SIDE "A" "OUT" POSITION
487570		 IN POSITION 2	 IN POSITION 6	 IN POSITION 12	 IN POSITION 6	POSITION 1	POSITION 2	POSITION 1	POSITION 1	DRIVER NO. 1 SIDE "A" "IN" POSITION
487571		NOT USED	 IN POSITION 5	 IN POSITION 10	 IN POSITION 10	POSITION 2	POSITION 1	POSITION 2	POSITION 2	DRIVER NO. 1 SIDE "B" "OUT" POSITION
487572		NOT USED	 IN POSITION 5	 IN POSITION 10	 IN POSITION 5	POSITION 2	POSITION 1	POSITION 2	POSITION 2	DRIVER NO. 1 SIDE "B" "IN" POSITION
487573		 IN POSITION 2	 IN POSITION 6	 IN POSITION 12	 IN POSITION 6	POSITION 2	POSITION 1	POSITION 1	POSITION 1	DRIVER NO. 2 SIDE "B" "IN" POSITION
487574		NOT USED	 IN POSITION 4	 IN POSITION 8	 IN POSITION 8	POSITION 2	POSITION 1	POSITION 2	POSITION 2	DRIVER NO. 2 SIDE "A" "OUT" POSITION
487575		NOT USED	 IN POSITION 4	 IN POSITION 8	 IN POSITION 4	POSITION 2	POSITION 1	POSITION 2	POSITION 2	DRIVER NO. 2 SIDE "A" "IN" POSITION

* REFER TO PAGE 6 FOR FINAL ADJUSTMENT ON ALBUM SWITCH.

** RATCHET WHEEL DRIVER "IN" AND "OUT" POSITIONS ARE ILLUSTRATED IN FIGURE 13. SIDES "A" AND "B" ARE IDENTIFIED IN FIGURE 14.

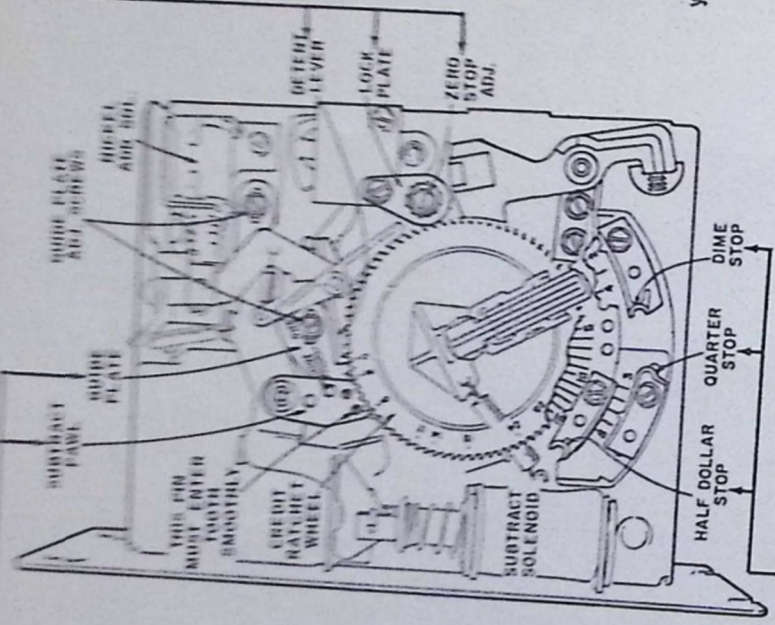
SUBTRACT PAWL AND GUIDE PLATE

POSITION NO. 1

- Advance Credit Wheel so detent lever is engaged with tooth No. 6.
- Loosen two screws on subtract pawl guide plate.
- Position guide plate so, when subtract solenoid operates, the subtract pawl enters tooth No. 13 without striking the sides of the tooth.
- Tighten screws on guide plate.

POSITION NO. 2

- Advance Credit Wheel so detent lever is engaged with tooth No. 6.
- Loosen two screws on subtract pawl guide plate.
- Position guide plate so, when subtract solenoid operates, the subtract pawl enters tooth No. 12 without striking the sides of the tooth.
- Tighten screws on guide plate.



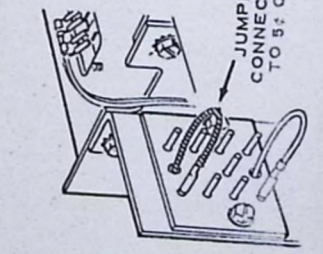
ADD STOPS POSITION

CREDITS FOR COINS ARE DETERMINED BY POSITIONING STOPS.

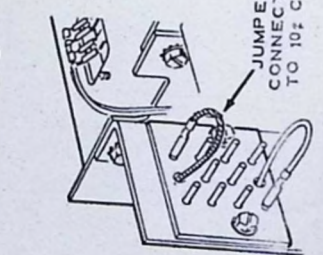
- Remove screw from stop.
- Shift stop to desired position using pointer on stop as indicator.
- Replace and tighten screw.

INCOME TOTALIZER JUMPER

POSITION NO. 1

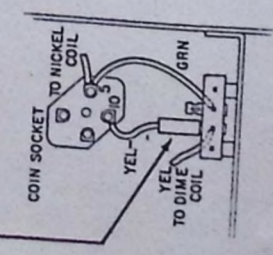


POSITION NO. 2

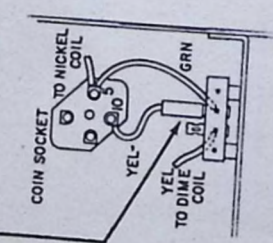


ALBUM PRICING UNIT JUMPER

POSITION NO. 1



POSITION NO. 2

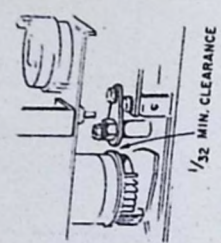


ZERO STOP POSITION NO. 1

- Remove lock plate. Loosen screw on zero credit stop and rotate stop so the long radius of the eccentric post is facing away from the Credit Wheel. See Note 1.
- Engage detent lever with No. 9 tooth on Credit Wheel.
- Bias the wheel against the stop.
- Adjust stop position so there is slight clearance between the tip of the detent lever and the face of the No. 9 tooth.
- Replace lock plate and tighten screws.

POSITION NO. 2

- Engage detent lever with No. 1 tooth on Credit Wheel.
- Remove lock plate. Loosen screw on zero credit stop and rotate stop so the long radius of the eccentric post is facing the Credit Wheel. See Note 1.
- Bias the wheel against the stop.
- Adjust stop position so there is slight clearance between the tip of the detent lever and the face of the No. 1 tooth.
- Replace lock plate and tighten screws.



NOTE 1: Make CERTAIN that positioning of eccentric post is such that a minimum clearance of 1/32 inch exists between outer edge of Album Credit "driver" and Lock Plate.

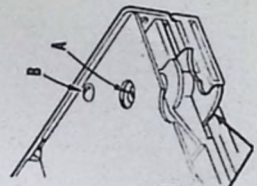
SLUG REJECTOR:

POSITION NO. 1

- LONG SCREW AT A
- SHORT SCREW AT B
- FLIPPER ANCHORED AS SHOWN

POSITION NO. 2

- LONG SCREW AT B
- SHORT SCREW AT A
- FLIPPER NOT ANCHORED



INCOME TOTALIZER

The LPC Model phonograph is equipped with an Income Totalizer which is located on the upper right hand side of the cabinet above the service switch as shown in *Figure 15*.

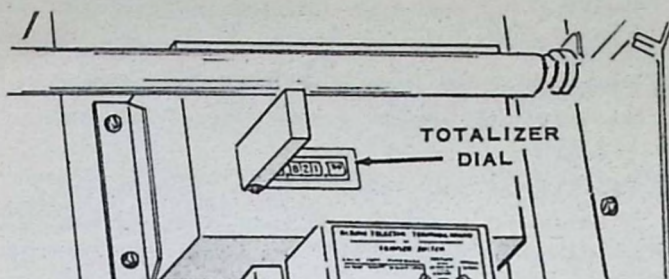


Figure 15. Totalizer Dial.

Model LPC1 contains a Type IT1 Income Totalizer which totals nickels, dimes, quarters and half dollars deposited in the phonograph and indicates actual value aggregated in the operation of the phonograph.

Phonograph Model LPC1R has a Type IT1R-56 totalizer which is designed to indicate total cash deposited in both the phonograph and all remote Stereo Consolettes connected to it.

An indicating light located on the right side of the record playing indicator panel is connected to the totalizer. It is momentarily illuminated at the time a coin is deposited either in the Phonograph or the Consolette. Duration of lighting depends on the value of the coin — shortest for nickels and longest for half dollars. This light is provided as a visual test that the totalizer is functioning properly.

SELECT-O-MATIC MECHANISM REMOVAL

The Select-O-Matic mechanism can be removed from the back of the cabinet for the purpose of repair or replacement.

To gain access remove twelve (12) No. 8 screws from the rear access panel. Then open cabinet lid and secure as described under "Cabinet Lid Support". Remove two (2) hex nuts which secure access panel bolts, as shown in *Figure 16*. The access panel can now be removed from the cabinet.

Pull pins out of mechanism mounting channels. Unplug cable assemblies and slide mechanism from cabinet.

COMPONENT REMOVAL

The Transistorized Stereo Amplifier, the Auto-Speed Unit, the Tormat Control Center as well as the Remote Control Stepper Unit can be slid out or completely removed from the cabinet for

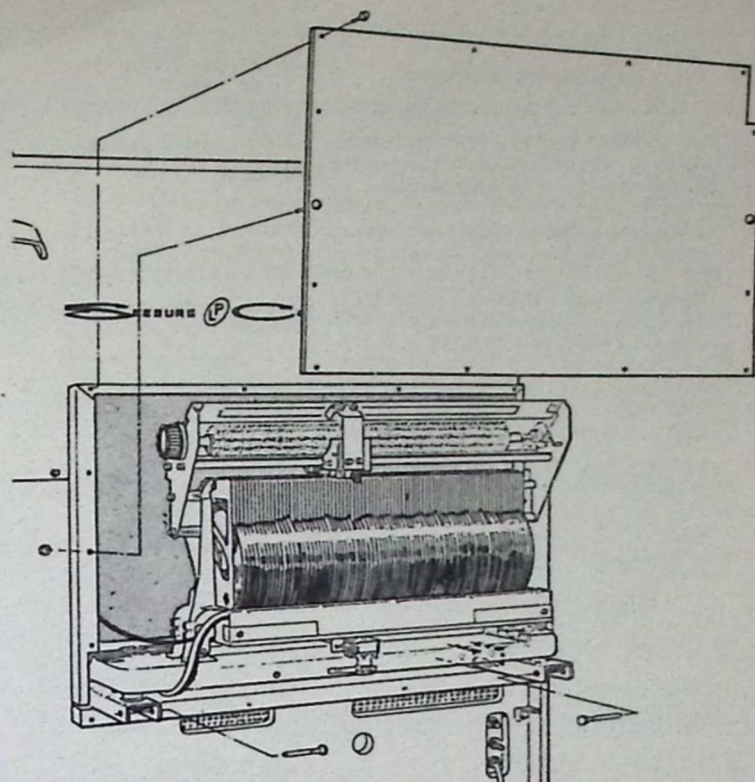


Figure 16. Mechanism Removal.

repair or replacement. These units are accessible by opening the front doors of the phonograph.

They are hung in pairs onto two slide channel assemblies; amplifier and Auto-Speed Unit on one channel assembly, Tormat Control Center and Stepper Unit on the other.

To remove one of these units from the cabinet, disconnect all cable assemblies leading to it. Then lift up the chassis release lever above the unit and pull the unit out by the handle on the chassis.

AUDIO CONTROLS

The Transistorized stereo amplifier, Type TSA1, is equipped with (1) a 3-position Bass Control, (2) a 3-position Treble Control and (3) a 3-position Automatic Record Quality Compensator. The first two controls, i.e. bass and treble, are dual controls to assure simultaneous adjustments for both Left and Right Channel Audio. They are adjusted to provide proper tone balance to suit location acoustics and personal preference as detailed in Tone Control Settings Chart, *Figure 17*. Item (3), Automatic Record Quality Compensator* is used to obtain the best possible performance from records consistent with their quality. Its effect is of a dynamic nature. It allows full range operation, but automatically reduces surface noise when music is at low level. Refer to *Figure 18* for settings.

* Pat Pending.

LOCATION CONDITIONS	TONE CONTROL SETTINGS
ACOUSTICALLY LIVE - HARD WALLS, CEILING AND FLOOR-LITTLE OR NO UPHOLSTERY AND DRAPERIES.	BASS MAX - MED TREBLE MIN
AVERAGE ROOM - AVERAGE AMOUNT OF SOUND DEADENING MATERIAL.	BASS MED TREBLE MED
ACOUSTICALLY DEAD - ACOUSTIC TILE, HEAVY DRAPERIES AND CARPETS, UPHOLSTERED BOOTHS.	BASS MED - MIN TREBLE MAX

ROOM SIZE - IN SMALL ROOMS REDUCE TREBLE RANGE ONE POSITION. IN LARGE ROOMS WITHOUT REMOTE SPEAKERS INCREASE TREBLE RANGE ONE POSITION.

NOISE - THE NOISE ENCOUNTERED IN SOME LOCATIONS (RESTAURANTS, ETC.) HAS A MASKING EFFECT ON HIGH FREQUENCIES. FINAL CONTROL SETTINGS SHOULD BE MADE UNDER ACTUAL NOISE CONDITIONS WITH A REPRESENTATIVE NUMBER OF PEOPLE PRESENT.

Figure 17. Tone Control Setting Chart.

CONDITION OF RECORDS	A.R.Q.C. SETTINGS
NEW (GOOD QUALITY)	MINIMUM
FAIR (AVERAGE)	MEDIUM
POOR (WORN AND SCRATCHED)	MAXIMUM

Figure 18. Automatic Record Quality Compensation.

Twenty-seven (27) different combinations of control settings of controls (1), (2) and (3) permit optimum adjustments for a wide variety of field conditions.

MASTER VOLUME CONTROL

The Master Volume Control controls both Left and Right Channels simultaneously and is accessible through a hole in the rear of the cabinet. Its shaft is slotted for use with a screw driver.

SELECT-O-MATIC PHONOGRAPH SPEAKERS

The phonograph speaker system includes four speakers: Two heavy duty 12-inch speakers and two wide range 8-inch speakers, are mounted inside the cabinet on the cabinet doors and connected through a stereo network to their respective amplifier channel. The 8-inch speakers are individually enclosed in acoustical chambers.

LONG PLAYING CONSOLE SPEAKER KIT, Type LPSK1

The kit consists of two completely assembled directional speaker units supplied with mounting hardware and cables for installation on the LPC Model phonograph cabinet. They are mounted on hinge brackets which permit directing to provide best stereo effect in a required listening area.

TWIN STEREO SPEAKERS

The Seeburg Twin Stereo Speakers are specifically designed to be used in pairs. The following types are available:

- Package of two, Type TW1-8, Twin Stereo Speakers for wall type installation (Part No. 512350).
- Package of two, Type TC1-8, Twin Stereo Speakers for corner installation (Part No. 512351).
- Package of two, Type TR1-8, Twin Stereo Speakers for recessed type installation (ceiling or wall) (Part No. 512352).
- Package of two, Type EBWC2-12 Stereo Speakers for wall or corner installation requiring the optimum bass response (Part No. 512392).

NOTE: Series TW1 Wall Speakers may be readily converted for corner installation by the addition of Corner Adapters available as a package of two each, Type CA1, Part No. 502881.

STEREO SPEAKER CONTROL

Type S10LT-3 (Accessory)

The Stereo Speaker Control, Type S10LT-3, is used for volume level adjustment of stereo speakers connected to constant voltage speaker lines. One or more pairs of stereo speakers may be controlled in seven 3 db steps (or turned off) without affecting other speakers connected to the stereo amplifier.

POWERED REMOTE VOLUME CONTROL

Type PRVC2 (Accessory)

The Powered Remote Volume Control, Type PRVC2, is an accessory which may be used with the phonograph to remotely control the volume and cancel selections.

The set includes a motor which is installed on the amplifier volume control and is operated by the remote switch to increase or decrease volume of the phonograph. A slip clutch permits volume adjustment at the phonograph independently of the remote control.

STEREO CONSOLETTTE, Type SC1

The remote choice of "Album" or "Single" play selection is made possible by the Seeburg Stereo Consolette when used in conjunction with Model LPC1R phonographs. The consolette is equipped with a pair of speakers - Right Channel and Left Channel - which provide for localized reproduction of selections. Speaker volume may be controlled at the consolette by push buttons marked LOW, MEDIUM and HIGH.

THE SEEBURG STEREOPHONIC SYSTEM BASIC RULES FOR INSTALLATION

THE FOLLOWING BASIC RULES FOR THE INSTALLATION OF THE SEEBURG STEREOPHONIC SYSTEM ARE GUIDEPOSTS TOWARD THE SUCCESSFUL ACHIEVEMENT OF STEREOPHONIC REPRODUCTION.

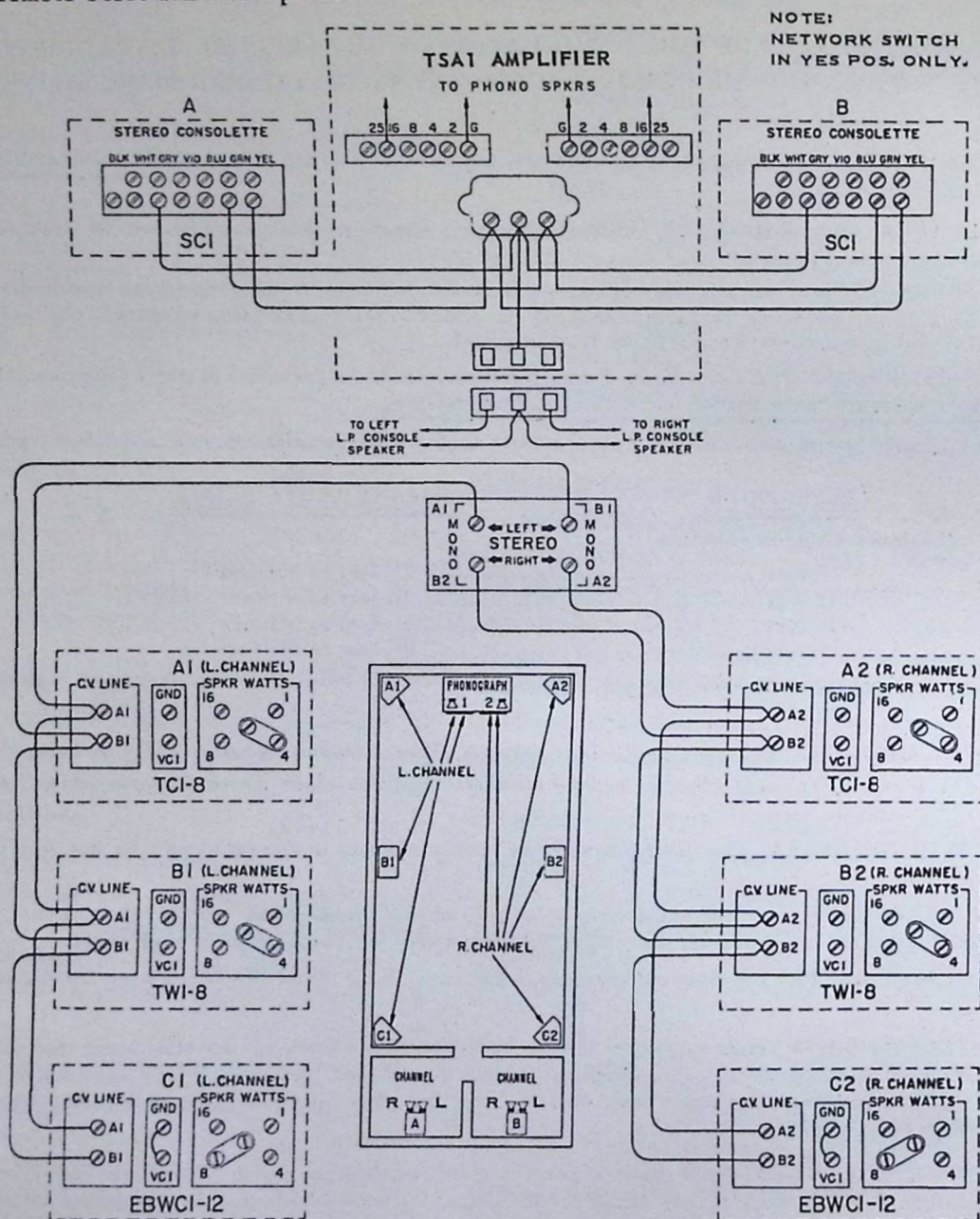
1. **ALL LOCATIONS:** There is not a location in the country, regardless of size, which cannot successfully and to good advantage use a Stereo System.
2. **"LP" CONSOLE SPEAKERS:** Seeburg "LP" Console Speakers should be positioned to provide best audio coverage in listening area near the phonograph.
3. **TWIN STEREO SPEAKERS:** In rooms too large for adequate audio coverage by the phonograph speaker array, at least one pair of remote twin Stereo Speakers, properly placed, is essential to the reproduction of stereo. Use additional pairs as required to obtain good distribution throughout the listening area.
4. **SPEAKERS IN PAIRS-OPPOSITE:** Remote Twin Stereo Speakers should be installed in pairs (approximately opposite one another) and the speakers of each pair should face into the same area.
5. **HEIGHT FROM FLOOR:** The proper distance from the floor to the grille centers of wall and corner speakers should be as follows:

<u>ROOM WIDTH</u>	<u>HEIGHT ABOVE FLOOR</u>
(Distance between channels)	
8 feet	7 feet to 7½ feet
12 feet.....	7½ feet to 8 feet
18 feet.....	8 feet to 8½ feet
25 feet to 30 feet	8½ feet to 9½ feet

6. **PHASING:** The connections must be such that the phasing of all remote twin stereo speakers and phonograph speakers will be alike.
7. **SPACING WITHIN A CHANNEL:** The spacing between the left channel remote speakers shall be about 15 to 20 feet; likewise, the spacing between the right channel remote speakers shall be about 15 to 20 feet - depending upon room dimensions.
8. **SPACING BETWEEN CHANNELS:** The distance between remote speaker channels should be not less than 8 feet, and not more than 30 feet.
9. **TEN PAIRS IS MAXIMUM:** At no time shall more than ten remote speakers be connected to either channel of an amplifier. If additional speakers are required, use a type HFA3 or a type HFA4 amplifier in each channel.
10. **BALANCE CHANNELS WATTS:** The sum of the wattage settings of all remote speakers must be the same for each channel.
11. **MORE BASS AT FAR POINTS:** When a pair of remote twin Stereo Speakers is installed more than 40 feet from a stereo phonograph, or in a separate room, a wire jumper should be placed from "VC1" to "GND" of each of these speakers. In these areas where the listener cannot hear the bass from the stereo phonograph it is important that twin stereo speakers, type EBWC1-12 be used.
12. **SPEAKERS JUMPERED - 8 WATTS MAX:** Remote speakers with wire jumpers from "VC1" to "GND" must never be connected for more than 8 watts each. Exception is the EBWC1-12 series which may be connected for 16 watts each.
13. **25 WATTS MAXIMUM:** Add total watts of all remote speakers in a channel with jumpers between "VC1" and "GND" to the wattage set-up of the phono speaker. This total must not exceed 25 watts. When individual remote speakers are connected for monaural operation, divide the wattage setting by two (2) to get loading on each channel.
14. **PHONO SPEAKER WATTAGE:** Add total watts of all remote speakers in a channel without jumpers between "VC1" and "GND". This must approximately equal the wattage of the phono speaker as set up on the Select-O-Matic speaker terminal strip. The "LPC" speaker loading may be considered as 4 watts per speaker without jumpers. The "LPSR" speaker loading may be considered at 1 watt per speaker without jumper.
15. **NETWORK SETTING:** Make sure that stereo network switch is set in "yes" position when using twin stereo speakers.
16. **BALANCING:** A stereo installation is never complete without a final test of balance between the two channels, using an output meter and a monaural record. Never attempt to balance system with a conventional stereo record.

COMPLETE STEREO SPEAKER SYSTEM INSTALLATION

Large room containing an LPC Model phonograph equipped with a Type LPCSK1 Speaker Kit and six remote speakers, set up exclusively for stereo reproduction. Two small adjoining rooms each provided with a Seeburg Stereo Console for remote selection and reproduction of stereo selections.



LEFT CHANNEL LOADING

"A" STEREO CONSOLETTES SPEAKER ----- 1 WATT
 "B" STEREO CONSOLETTES SPEAKER ----- 1 WATT
 LEFT LPCSK1 SPEAKER ----- 4 WATTS
 A1 (NO "VC1" TO "GND" JUMPER) SET AT ----- 4 WATTS
 B1 (NO "VC1" TO "GND" JUMPER) SET AT ----- 4 WATTS

TOTAL 14 WATTS

WHICH APPROXIMATES PHONOGRAPH SPEAKER
TAP SETTING OF 16 WATTS.

C1 (WITH "VC1" TO "GND" JUMPER) SET AT ----- 8 WATTS
 PHONOGRAPH SPEAKER TAP SETTING OF ----- 16 WATTS

TOTAL 24 WATTS

WHICH IS SATISFACTORY AMPLIFIER LOADING.

RIGHT CHANNEL LOADING

"A" STEREO CONSOLETTES SPEAKER ----- 1 WATT
 "B" STEREO CONSOLETTES SPEAKER ----- 1 WATT
 RIGHT LPCSK1 SPEAKER ----- 4 WATTS
 A2 (NO "VC1" TO "GND" JUMPER) SET AT ----- 4 WATTS
 B2 (NO "VC1" TO "GND" JUMPER) SET AT ----- 4 WATTS

TOTAL 14 WATTS

WHICH APPROXIMATES PHONOGRAPH SPEAKER
TAP SETTING OF 16 WATTS.

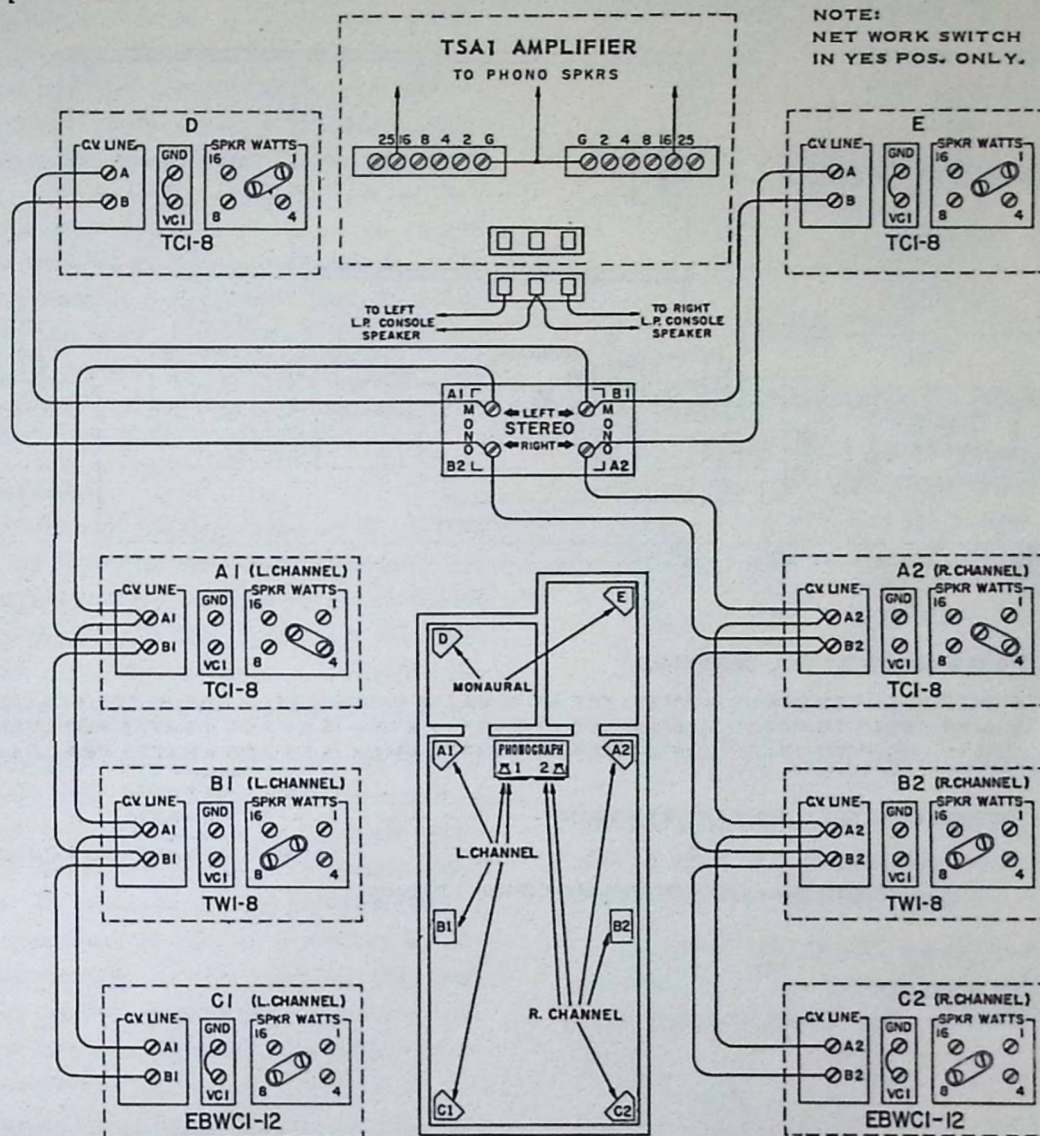
C2 (WITH "VC1" TO "GND" JUMPER) SET AT ----- 8 WATTS
 PHONOGRAPH SPEAKER TAP SETTING OF ----- 16 WATTS

TOTAL 24 WATTS

WHICH IS SATISFACTORY AMPLIFIER LOADING.

COMBINED STEREO AND MONAURAL SPEAKER SYSTEM INSTALLATION

Large room containing LPC Model phonograph equipped with a Type LPCSK1 Speaker Kit and six remote speakers, set up for stereo reproduction. Two smaller adjoining rooms equipped with separate speakers for simultaneous monaural reproduction.



LEFT CHANNEL LOADING

LEFT LPCSK1 SPEAKER	4 WATTS
A1 (NO "VC1" TO "GND" JUMPER) SET AT	4 WATTS
B1 (NO "VC1" TO "GND" JUMPER) SET AT	8 WATTS

TOTAL 16 WATTS

WHICH IS EQUAL TO PHONOGRAPH SPEAKER TAP SETTING OF 16 WATTS

C1 (WITH "VC1" TO "GND" JUMPER) SET AT	8 WATTS
D (WITH "VC1" TO "GND" JUMPER)	$\frac{1}{2}$ WATT
E (WITH "VC1" TO "GND" JUMPER)	$\frac{1}{2}$ WATT

TOTAL 9 WATTS

PHONOGRAPH SPEAKER TAP SETTING OF 16 WATTS

TOTAL 25 WATTS

WHICH IS SATISFACTORY AMPLIFIER LOADING.

RIGHT CHANNEL LOADING

RIGHT LPCSK1 SPEAKER	4 WATTS
A2 (NO "VC1" TO "GND" JUMPER) SET AT	4 WATTS
B2 (NO "VC1" TO "GND" JUMPER) SET AT	8 WATTS

TOTAL 16 WATTS

WHICH IS EQUAL TO PHONOGRAPH SPEAKER TAP SETTING OF 16 WATTS

C2 (WITH "VC1" TO "GND" JUMPER) SET AT	8 WATTS
D (WITH "VC1" TO "GND" JUMPER)	$\frac{1}{2}$ WATT
E (WITH "VC1" TO "GND" JUMPER)	$\frac{1}{2}$ WATT

TOTAL 9 WATTS

PHONOGRAPH SPEAKER TAP SETTING OF 16 WATTS

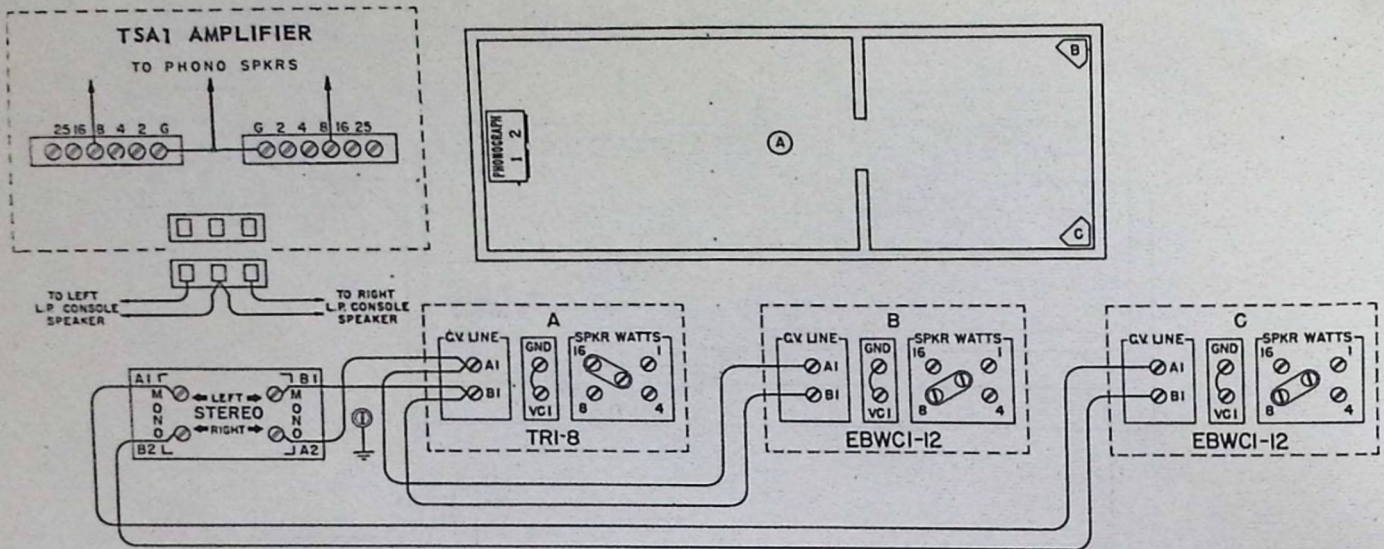
TOTAL 25 WATTS

WHICH IS SATISFACTORY AMPLIFIER LOADING.

NOTE: "D" and "E" speakers are operated monaurally only because of their connections at the amplifier terminal setup. This is a preferred connection where a single speaker is used in a listening area.

MONAURAL ONLY SPEAKER SYSTEM INSTALLATION

Large room containing phonograph and one remote speaker. Smaller room equipped with two corner speakers only.



POWER DRAWN BY ALL SPEAKERS

A (WITH "VC1" TO "GND" JUMPER) SET AT 16 WATTS WHICH IS $16 \div 2$ OR 8 WATTS PER CHANNEL
 B (WITH "VC1" TO "GND" JUMPER) SET AT 8 WATTS WHICH IS $8 \div 2$ OR 4 WATTS PER CHANNEL
 C (WITH "VC1" TO "GND" JUMPER) SET AT 8 WATTS WHICH IS $8 \div 2$ OR 4 WATTS PER CHANNEL

	TOTAL	16 WATTS
PHONOGRAPH SPEAKER TAP SETTING OF -----		8 WATTS
	TOTAL	24 WATTS PER CHANNEL

WHICH IS SATISFACTORY AMPLIFIER LOADING

Record Care

To avoid accumulation of dust and dirt, keep oil off the records. Wipe hands with a clean cloth before handling records, and always handle records by the edge. Records that show signs of surface dust or dirt should be wiped with a slightly dampened cloth, using a circular motion. Use only water to dampen the cloth - solvents will damage the records. Records not in use should be stored on edge in a cool place. Avoid exposing the records to excessive heat. Records become overheated in a very short time if exposed to direct sunlight or if stored in a closed automobile or truck. Temperature above 120 degrees F. should be avoided. See instructions on "PLACING THE SELECT-O-MATIC".

Stylus Replacement

In the presence of friction, wear of the Stylus starts with the first play and continues until the Stylus is replaced. The tone quality is good and distortion remains at a low figure for the first few thousand plays but gradually distortion increases until a disagreeable amount is noticed.

When only good vinylite 45 r.p.m. or 33-1/3 r.p.m. records are used, armature assemblies with diamond styluses should be inserted every four or five thousand plays to maintain good reproduction. If, because of the presence of oil on the records, dust or dirt is permitted to accumulate and remain on the surface, the wear will be more rapid; economical operation will require more frequent armature assembly cleaning or replacement.

Your Seeburg Distributor has equipment for microscopic examination of styluses to determine whether cleaning or replacement is necessary. If cleaning is all that is required, the Seeburg Ultrasonic Stylus Cleaner will scientifically and rapidly rehabilitate the stylus.

CAUTION: If the armature assemblies are not cleaned or replaced before objectionable distortion sets in, the records may be permanently damaged, and cleaning or replacing the styluses will not restore the original tone quality.

To Replace Armature Assemblies

1. Make a selection to the right of magazine center and left side of a record to position carriage and pickup arm cradle for easiest access to styluses.

2. To remove armature closest to carriage cover encircle pickup arm and grasp armature assembly T-ends with thumb and forefinger and push down. See Figure 19.

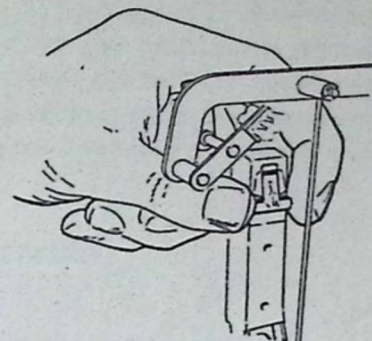


Figure 19. Rightside Armature.

3. Remove second armature by gripping the top portion of the "T" using the thumb and forefinger. Light pressure in the direction away from the Stylus Point will slide the Armature out of the cartridge slot.



Figure 20. Leftside Armature.

4. Install new Armature Assembly by laying it flat in open end of cartridge slot, and sliding forward in slot until it bottoms.

In order to retain good quality reproduction, it is necessary to keep the pickup and Styluses clean and in good condition.

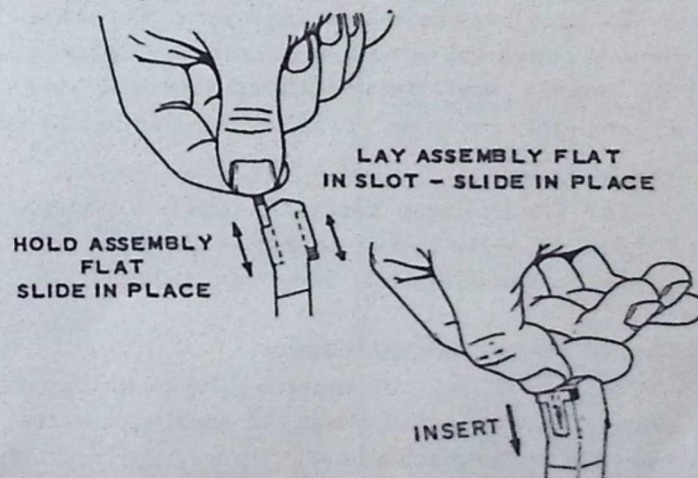


Figure 21. Installing Armature.

CAUTION: The pickup and styluses must be handled carefully or the delicate armature suspension may be damaged.

ADJUSTMENT OF 45 R.P.M. TRANSISTORIZED AUTO-SPEED UNIT

If a listening test indicates off-speed (not 45 r.p.m.) turntable operation, adjust the auto-speed unit as follows:

1. Replace a record with the Seeburg 45 r.p.m. Auto-Speed Strobe Disc, Part No. 487388 for 60 cycle phonographs or Part No. 487389 for 50 cycle phonographs. Light source frequency must conform to frequency indicated on Strobe Disc.
2. Select Strobe Disc on to the mechanism turntable and carefully prop pickup arm out of the way.
3. Allow unit to run approximately 3 minutes.
4. Set the motor speed to 45 r.p.m. by adjusting the Motor Speed Control so that the outer and inner bands on the Strobe Disc move in opposite directions.
5. Remove the Strobe Disc.

MAINTENANCE AND SHIPPING

LUBRICATION

Follow the complete lubrication instructions given on the lubrication chart in the envelope on the inside wall of the phonograph.

The recommended lubricants are Seeburg Select-O-Matic Oil, Part No. 53014, and Aero Lubriplate, Part No. 53006.

LIGHT REPLACEMENT

Upper Cabinet Light

The upper Cabinet Light illuminates the upper Program Holders. It is a 30-watt, 36-inch cool white fluorescent tube which is accessible for replacement when the cabinet lid is latched in the raised position.

Lower Cabinet Light

This is a 30-watt, 36-inch cool white fluorescent light with associated starter. It illuminates the lower cabinet lid section, pricing window, instruction windows, electrical selector buttons as well as the front of the cabinet.

To gain access to the lamp for replacement purpose, open cabinet lid and doors. Turn clamps 90 degrees and swing diffuser outward, see Figure 22.

Credit Lamps

The Credit Lamp Socket Assembly uses two (2) No. 55 bulbs and is cabled on the right side of the Tormat Electrical Selector.

Record Playing Indicator Lamp

This is a No. 15 miniature lamp which is plugged into a socket above the popularity meter solenoid in the mechanism.

PREPARING INSTRUMENT FOR MOVING

1. Put the shims under the base, at the mechanism hold-down bolts.
2. Tighten four mechanism hold-down nuts.
3. Remove all records from magazine.

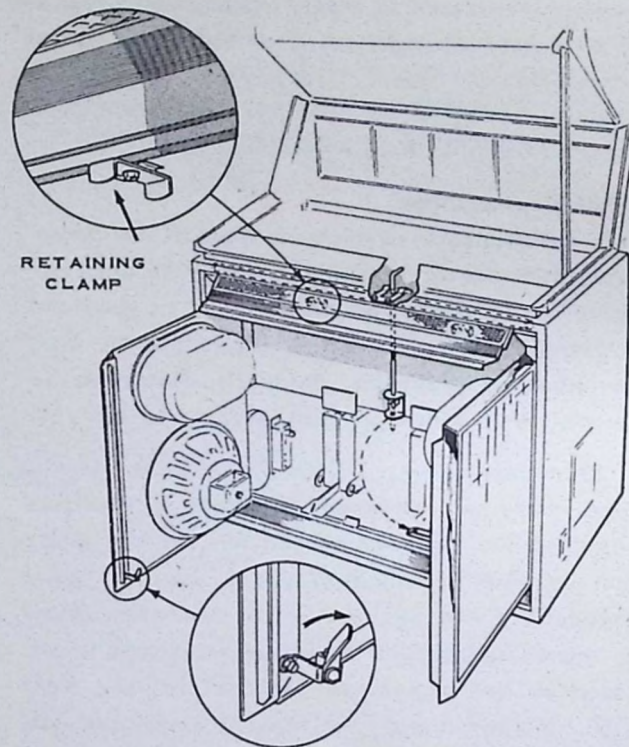


Figure 22. Lower Lamp Removal.

4. With the pickup arm in left hand side playing position, scan mechanism to a point at selection A1.
5. Place protective tube over pickup cartridge and install pickup arm shipping support.
6. Put two fibre pads (a long pad in the rear and a short pad in the front) under the carriage wheels and bolt the carriage to the base by means of two $4\frac{1}{2}$ inch long thumb screws, which are to be inserted through mechanism base.

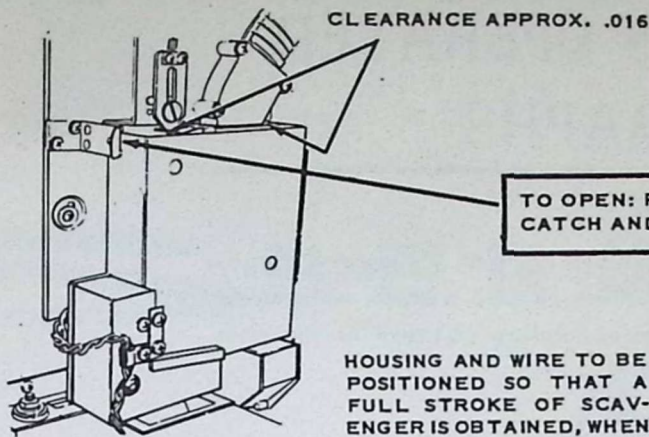
TO SHIP

If the instrument is to be shipped by way of a transportation company, it should be blocked and crated in the same manner in which it was received from the factory.

SLUG REJECTOR

5¢, 10¢, 25¢

5¢, 10¢, 25¢, 50¢



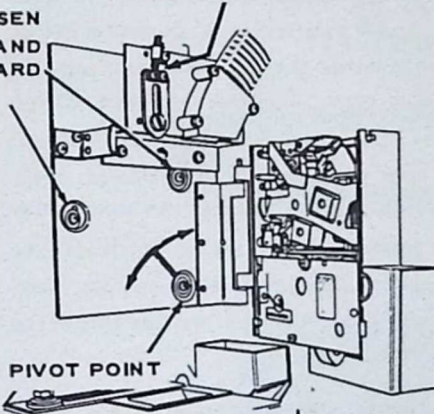
HOUSING AND WIRE TO BE POSITIONED SO THAT A FULL STROKE OF SCAVENGER IS OBTAINED, WHEN SCAVENGER BUTTON IS DEPRESSED FLUSH.

APPROX. .016 CLEARANCE

TO OPEN: RELEASE THIS CATCH AND SWING OUT

HOUSING AND WIRE TO BE POSITIONED SO THAT A FULL STROKE OF SCAVENGER IS OBTAINED, WHEN SCAVENGER BUTTON IS DEPRESSED FLUSH.

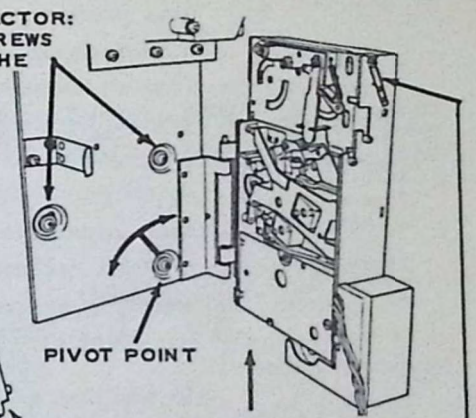
TO LEVEL: LOOSEN THESE (2) SCREWS AND SWING FRAME TOWARD FRONT OR REAR.



SLUG REJECTOR AND FRAME ASSEMBLY MAY BE LIFTED UP AND OFF FOR EXAMINATION OR SERVICE.

TO REMOVE SLUG REJECTOR FROM ITS FRAME LIFT UP AND SWING OUT.

TO LEVEL SLUG REJECTOR: LOOSEN THESE (2) SCREWS AND SWING TOWARD THE FRONT OR REAR



SLUG REJECTOR AND ITS FRAME MAY NOW BE LIFTED UP AND OFF.

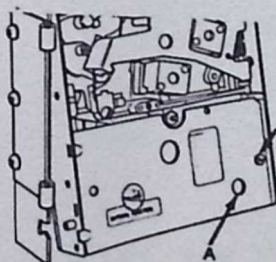
TO REMOVE SLUG REJECTOR: RELEASE THIS CATCH THEN LIFT 50¢ SECTION UP AND OUT

SLUG REJECTORS EQUIPPED WITH NICKEL FLIPPERS CAN BE SET UP FOR SINGLE NICKEL OR TWO NICKEL OPERATION. FIRST REMOVE SLUG REJECTOR FROM ITS FRAME.

NEXT, LIFT 5¢, 10¢ & 25¢ SECTION UP AND SWING OUTWARD

NATIONAL REJECTORS - SLUG REJECTOR

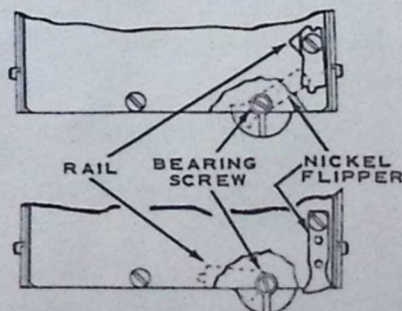
ACCEPTORS, INC. - SLUG REJECTOR



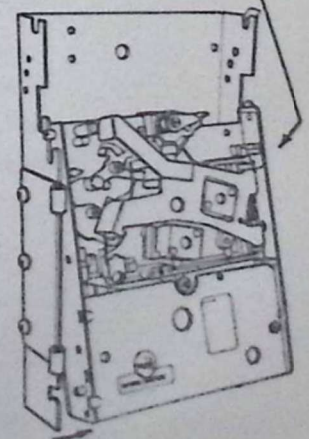
TWO NICKEL OPERATION: FLIPPER NORMAL SHORT SCREW AT "A", LONG SCREW AT "B".

SINGLE NICKEL OPERATION: FLIPPER LOCKED OUT SHORT SCREW INSTALLED AT "B", LONG SCREW AT "A" WITH FLIPPER IN MAXIMUM COUNTER-CLOCKWISE POSITION.

TWO NICKEL OPERATION



SINGLE NICKEL OPERATION



SEEBURG COIN OPERATED PHONOGRAPHS

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Except as hereinafter stated, THE SEEBURG CORPORATION warrants this product, manufactured by it, to be free from defects in material or workmanship under normal use. Our obligation under this warranty is limited to making good at our factory any part or parts thereof which shall, within one year after delivery of such product to the original purchaser, be returned to us through our authorized distributor from whom purchased, and which our examination shall disclose to our satisfaction to have been thus defective. Any part found by us to be defective will be exchanged by our distributor without charge to the owner; however, labor and transportation costs incidental to the replacement or exchange of such parts shall be borne by the owner.

In addition to the warranty set forth above, the Tormat Memory Unit and the Pickering Magnetic Pickup (excepting the armature assemblies) are warranted for an additional four years. The warranty covering the Tormat Memory Unit is void in case its seals are broken.

This warranty does not extend (1) to any of our products which have been subject to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, (2) to units which have been repaired or altered by anyone other than our distributor, (3) to cases where the manufacturer's date code or the serial number of the product has been removed, defaced or changed, (4) to tubes, lamps, lamp starters, glass, and fuses, or (5) to accessories not of our own manufacture used with our products.

This warranty applies only to our products which are used within the continental limits of the United States of America and is in lieu of all warranties expressed or implied, and no representative or person is authorized to assume for us any other liability in connection with the sale of our products.

THE SEEBURG CORPORATION

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MECHANISM OPERATION

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SELECT-O-MATIC "160" MECHANISM

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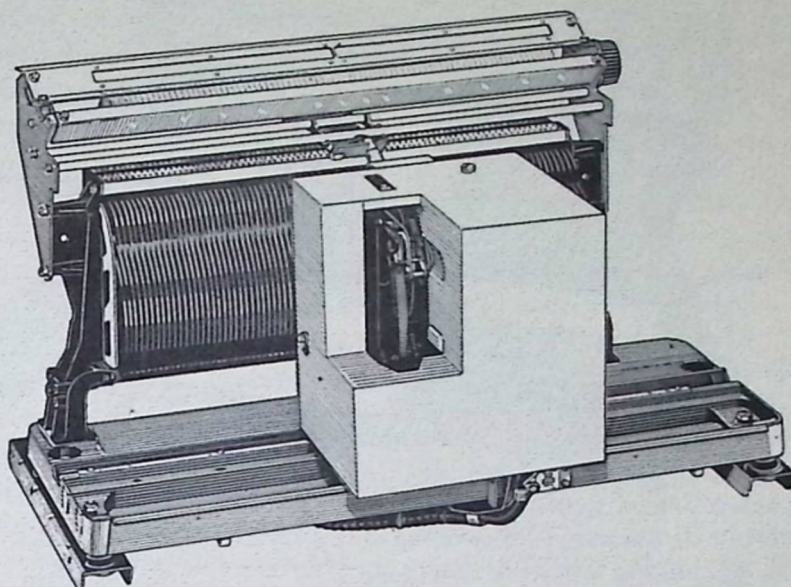
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SEEBURG

SELECT-O-MATIC "160" MECHANISM



The Select-O-Matic "160" Mechanism, Type 133S1, is designed for automatic selective playing of any of the selections in a program of 80, 33-1/3 r.p.m. and 45 r.p.m., 7-inch diameter records. It will play either side of the records in Single Play Operation or, with but one selection, both sides in Album Play.*

There are two fundamental parts of the Mechanism - a magazine, and a carriage assembly. The magazine holds the records. The carriage assembly plays the desired selections by progressively withdrawing the records, playing them, and restoring them to their original position in the magazine.

The record magazine holds the records in a vertical position in openings or spaces that are approximately 1/4 inch wide. It is filled from the front of the instrument by merely placing the records in the spaces. The spaces are numbered A1 to V8 for convenience in indexing the selections. There are 8 groups numbered 1 to 8 with 20 selections in each numbered group. To avoid confusion with the figure "1", the letter "I" is not used.

*The terms Album Play and Single Play are used in this discussion and in normal reference to the phonograph. Album Play, as performed by the Type 133S1 Mechanism is defined as playing both sides of a record -- left side first, then the right side -- if either the left or right side has been selected. Single Play refers to conventional operation in which only the selected side of the record is played.

The carriage assembly moves, or scans from side to side of the instrument on a track parallel to, and in front of, the records. The scanning operation commences as soon as a selection is made. The carriage stops scanning when it comes to the selected record and transfers the record from the magazine to the playing position on the carriage. The carriage transfers the record (when it has finished playing) to its original position in the magazine and scans to the next selected record, or, if no other record has been selected, will come to a stop at its normal rest position near the left side of the magazine.

SEQUENCE OF PLAYING

The carriage assembly changes direction of scanning only at the ends of the magazine, and the scanning operation is interrupted for playing only when the carriage is scanning toward the right. The sequence of playing selections will, then, be established by their position in the magazine and the position of the carriage when

SELECT-O-MATIC "160" MECHANISM

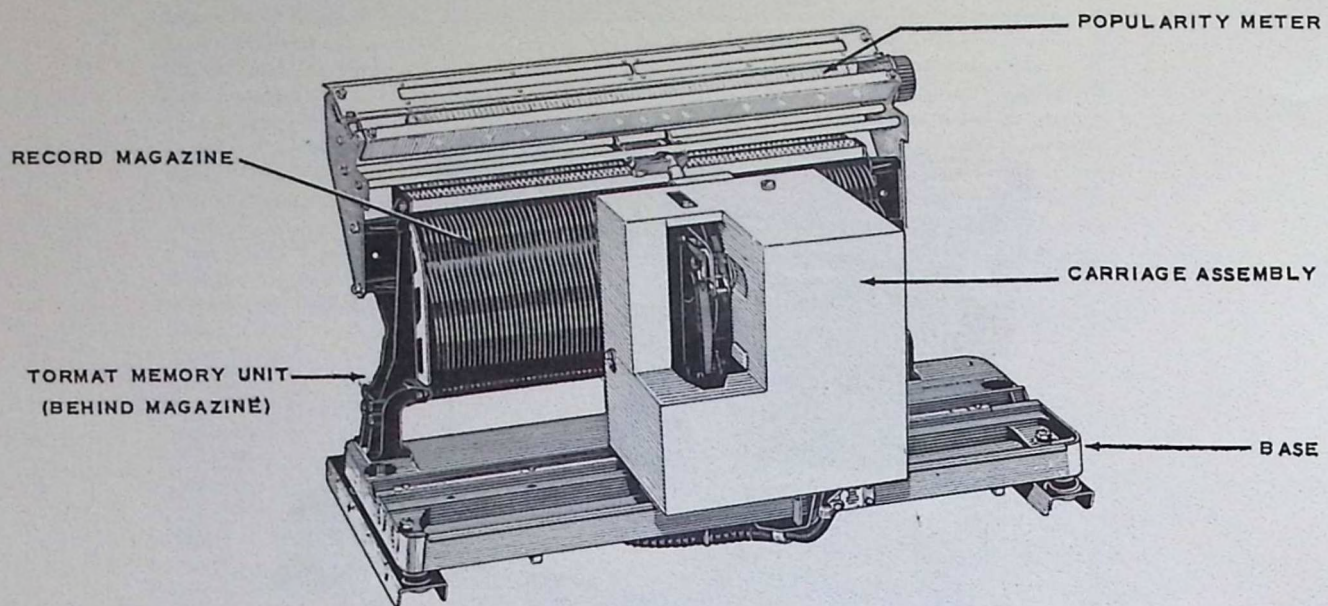


Figure 2.

selection is made. Selections of the left sides of records and selections of right sides will be played as the carriage progresses from the left side of the magazine. If both sides of a record are selected, the left side will be played, then the right side.

SELECTION OF RECORDS

The mechanism is controlled for playing selected records by the Tormat Memory Unit on the back of the mechanism and a movable Contact Plunger Block that is attached to the carriage assembly. There are one hundred and sixty toroid shaped magnetic cores in the

Memory Unit - arranged in two rows of eighty each - one for the left side of each record in one row, one for the right side of each record in the other row.

When a selection is made with the Electrical Selector, or by remote control, a pulse of current is passed through the magnetic core corresponding to the selection. The current pulse changes the magnetic state of the core from zero (not selected) to selected.

The switching operation that controls the selection pulse for the Memory Unit also closes a circuit to a play control add solenoid. The solenoid, which is only momentarily energized, operates a switch which closes a circuit that starts the scanning operation of the carriage assembly.

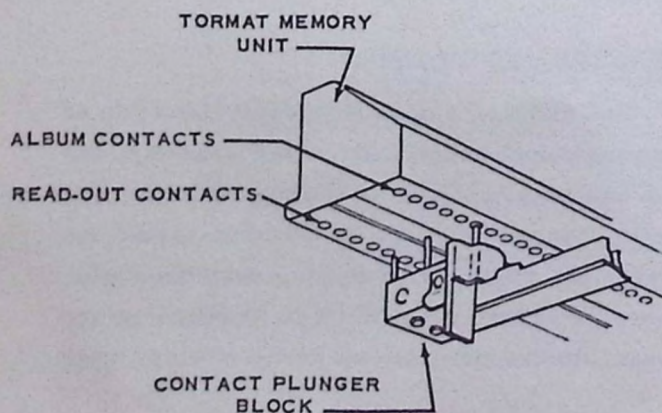


Figure 3.

As the carriage scans, the contact plunger block shown in Figure 3, moves with it so a contact plunger progressively and momentarily connects with each of eighty read-out contacts that are arranged in a row near one edge of the Memory Unit. There is one of these read-out contacts for each record space and each contact is connected to a Memory Unit circuit which is threaded through two magnetic cores. The two cores threaded by these individual circuits are those corresponding to the selections on the left

SELECT-O-MATIC "160" MECHANISM

and right sides of the record in the magazine space associated with the read-out contact.

During the interval in which the contact plunger is touching one of the read-out contacts, a current pulse is passed through the circuit and the cores. When the pulse passes through a core which is in the selected state, an output pulse is generated in an output circuit of the Memory Unit. There are two of these output circuits; one is for the pulse generated by any one of the eighty cores representing the left sides of the records, the other is for the pulse generated by any one of the eighty cores representing the right sides of the records. The two circuits, a left and a right, connect through amplifying circuits to, respectively, a Left Side and a Right Side Relay. Either relay when energized by an output pulse pre-sets mechanism control circuits and closes a circuit to a trip solenoid which, when operated while the carriage is scanning, causes the carriage to stop and be accurately detented at the selected record.

When the carriage is detented, the transfer arm rolls the selected record from the magazine, up a ramp to the turntable. After the record has been brought to the turntable, the clamp arm lifts it from the ramp and clamps it, properly centered, in the playing position. Because the turntable is rotating, the record will start to turn as soon as it is clamped. When the clamping operation is completed, the pickup stylus is set on the record and is released so the stylus will follow the record grooves. The mechanism is then in the record-playing position.

If the left side of the selected record is to be played, the direction of rotation of the mechanism drive motor and the record turntable will be the same during record transfer and play as during the left-to-right scanning, i.e., the turntable will be turning clockwise as viewed from the left side. The pickup arm must be at the left side for left side record play and, if not already there, will be moved to that position during the early part of the record transfer operation.

If only the right side of the selected record is to be played, the drive motor and turntable

will reverse direction immediately after the carriage is detented at the record position. All of the subsequent transfer sequence, record playing and return of the record to the magazine occur with the turntable turning in the counter-clockwise direction. The pickup arm must be at the right of the record for right side play and, if not already on that side, will be shifted during the early part of the transfer operation.

When the record has finished playing the pickup will have moved the arm to a position which causes it to operate a trip switch. The switch completes a circuit to a relay in the phonograph amplifier which, in turn, closes a circuit to the trip solenoid. This is the same trip solenoid which operated to detent the carriage and initiate the transfer of the record to the playing position. This second operation of the solenoid, occurring at the moment of record trip-off, starts the operation in which the record is transferred from the playing position back toward the magazine. In this operation the above cycle is reversed - the pickup is lifted from the record; the clamp arm is withdrawn so the record is released; the transfer arm lowers the record.

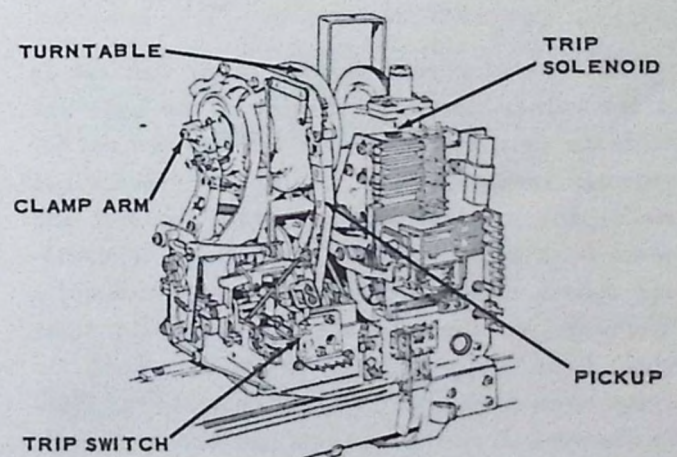


Figure 4.

If only the left side of the record is to be played, the record is transferred fully into the magazine on completion of playing and the carriage again scans. There is no change of motor or turntable rotation in the entire sequence of scan, transfer to playing position, play, transfer to the magazine, and scan.

Turntable rotation is counter-clockwise when trip-off occurs after completion of right side play and continues in this direction during the subsequent return of the record to the magazine. When the record has been fully transferred, the motor again changes direction, the turntable again turns clockwise and the left-to-right scanning resumes.

If both sides of a record are to be played, the left side will play first. When trip-off occurs on completion of left-side play, the record is transferred to the magazine but the carriage, instead of scanning as it does after left-side-only playing, begins another record transfer operation. This transfer operation is initiated by reversal of the drive motor rotation and the transfer, as well as the subsequent playing, trip-off and return of the record to the magazine take place with counter-clockwise turntable rotation. As with right-side-only playing, the motor changes direction when the record is fully transferred so the turntable turns clockwise and the carriage resumes left-to-right scanning.

The normal at-rest position of the carriage is a few inches from the left side of the base and with the mechanism control circuits pre-set for carriage scanning to the left. When a selection is made, the carriage moves toward the left and when it is at the left end of the base, a reversing switch is actuated. This changes the motor direction so the carriage scans to the right until it is stopped at the selected record. On completion of record play, scanning to the right is resumed. If no other record has been selected, the carriage scans to the right, past the position for playing the record in the right end magazine space. At this point the reversing switch is again actuated so the right-to-left direction is resumed. The carriage continues past the rest position to the left end of the base, again reverses, travels to the extreme right, again changes direction to travel to the left. It stops when it reaches the rest position. Briefly, the carriage will scan after a selection has been made, until it has twice moved to left through the rest position.

SCAN - TRANSFER

All the operations of the mechanism - scan, transfer and playing - are powered by a motor through gears to the record turntable and, through a clutch, to a cam assembly or to a sprocket assembly. These parts are shown in their relative positions in *Figure 5*. It can be seen that the turntable and the clutch shaft will turn whenever the motor is running. The clutch member is loosely fitted on the clutch shaft and

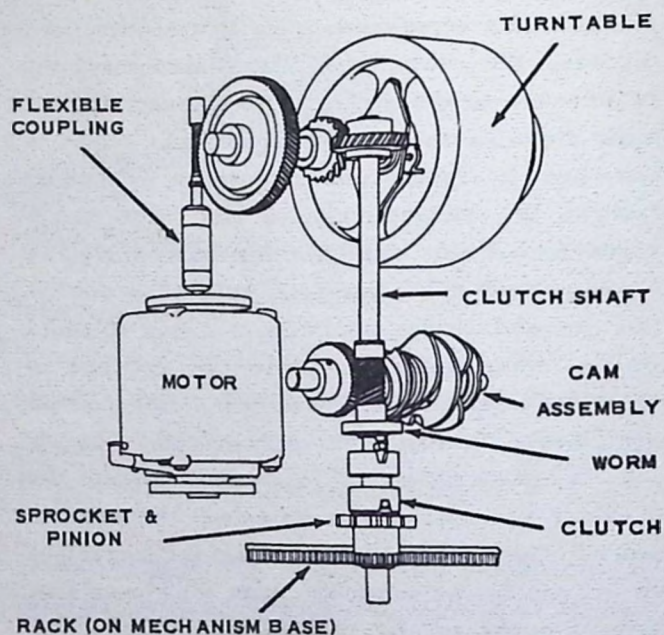


Figure 5.

can be moved vertically. One or both the drive pins shown in the enlarged view of the clutch, *Figure 6*, will be engaged in the notches of the clutch at all times so the clutch, although free to move up and down, will be turning with the shaft whenever the motor is in operation. In the scan operation of the mechanism, the clutch

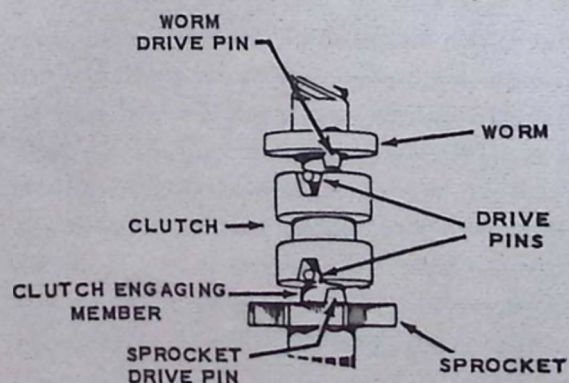


Figure 6.

is in its lowered position and is engaged with the pin on the upper end of the sprocket. In the transfer operation, the clutch is in its raised position and is engaged with the pin on the lower end of the clutch worm. In the play position, the clutch is between the sprocket and worm pins so that only the turntable is being driven by the motor.

When the rotating clutch is lowered so it is engaged with the sprocket, the pinion (which is part of the sprocket) is also turning. The pinion is meshed with a gear rack which is fastened to the mechanism base and extends the length of the magazine. As the pinion turns, it drives the carriage in the movement referred to as "scanning". The direction of scanning is determined by the direction of rotation of the pinion and is changed by reversing the motor.

CLUTCH ENGAGING MEMBER

The clutch is lowered to the scan position as the concluding move in the transfer of a record to the magazine. The clutch rotation is such that no direction change is required to resume left-to-right carriage scanning when a record is transferred from left-side playing. The clutch, then, can drop from its transfer (lifted) position directly to its lowered (scan) position. If, however, the transfer is from right-side playing position, the clutch rotation must be changed after all of the transfer operation except sprocket engagement has been completed. This is accomplished with a clutch engaging member which provides an additional, intermediate clutch position between play and scan position and effective only when the clutch rotation is opposite to that required for left-to-right scanning. The clutch engaging member is indicated in Figure 6 and shown in more detail in Figures 7a and 7b. It is driven by the lower clutch drive pin and turns with the clutch shaft but its position on the shaft with respect to the drive pin and clutch depends on the direction of shaft rotation when the clutch is not engaged with the sprocket pin.

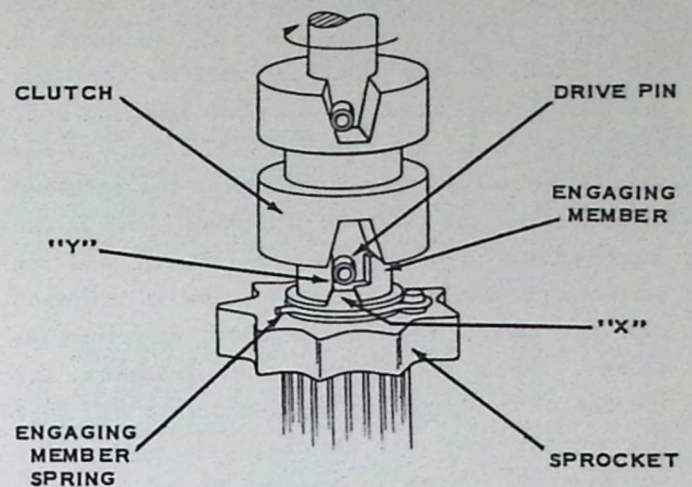


Figure 7a.

In record transfer following left side play, the clutch engaging member is in the position shown in Figure 7a. Clutch shaft rotation is shown by the arrow and the drive pin is turning the engaging member by pressure against the side of the notch at "Y". The sprocket is not turning so the friction of the engaging member spring assures that the member will remain in the position shown. It will be noted that the shoulder "X" is beneath the drive pin and aligned with the notch in the clutch. In this engaging member position the clutch can be lowered to engage the sprocket drive pin.

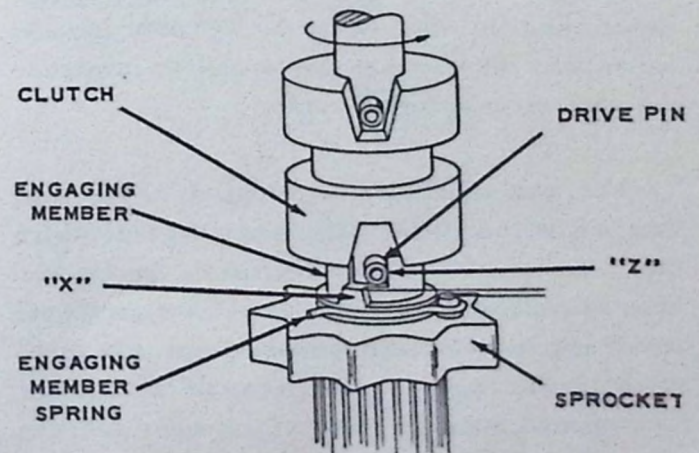


Figure 7b.

Figure 7b shows the clutch engaging member in its position during record transfer following right-side play. The clutch drive pin is now

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against the side of the notch at "Z" and the shoulder "X" is not aligned with the notch in the clutch. In this engaging member position, the clutch can move toward scan position only until it rests on the shoulder "X". This is not enough downward travel to engage the sprocket or to release the carriage detenting. This is the intermediate clutch position which will be maintained until the reverse relay is released and the motor and clutch shaft direction reverses. When the clutch shaft reverses, the friction of the engaging member spring will hold the member until the clutch pin is against the notch as in Figure 7a and the clutch can fall, engage with the sprocket pin and be fully in the scan position with the carriage moving to the right.

CAM ASSEMBLY

When the clutch is raised and engaged with the clutch worm, the cam assembly rotates and, in turning, operates the parts of the carriage that are associated with the record transferring operation. During the transition of the carriage from the scan to the play position, the cam assembly turns one-half revolution. It makes another one-half turn during the change back to the scan position. Its direction of rotation is determined by the direction of rotation of the motor and is the same during both transfer operations so it makes one complete revolution for each record playing cycle.

The cam assembly, although a single unit, has eight individual cam faces each of which has a definite function in the transfer operations. The contour of each of the cams is symmetrical about an axis through its scan and play positions so the sequence and timing of the carriage operations are the same for either rotation direction of the motor.

Figure 8 shows the cam assembly and identifies the different cams. The reset and clutch cams operate in conjunction with a trip mechanism as a part of the clutch control. It is the trip mechanism and the levers associated with

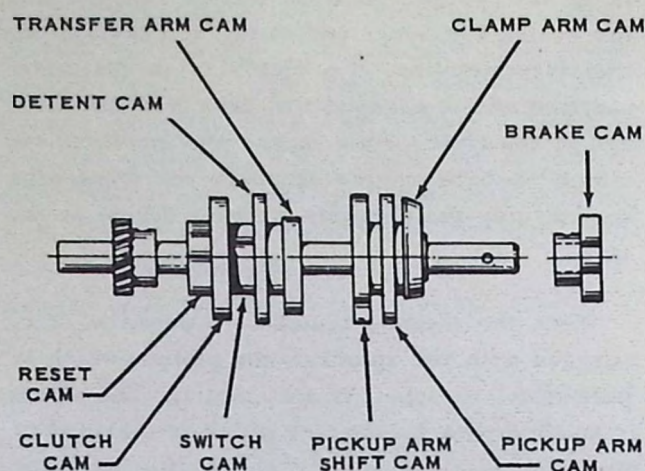


Figure 8.

it which move the clutch to the scan, transfer and play positions. The third cam - the switch cam - operates a cam switch which, in turn, operates mechanism control circuits. The detent cam operates through a series of levers to hold the carriage at a selected record position (magazine record space) and maintains alignment of the turntable with the magazine while the record is played and also while it is being transferred. The transfer arm cam operates the transfer arm through a gear segment to elevate a record to the turntable and to lower the record to the magazine after playing. The pickup shift cam moves the pickup for left or right side playing of a record. The movement of the pickup arm to and away from the record and to the normal starting position is performed through levers by the pickup arm cam. The clamp arm cam, operating the clamp arm, holds the record in playing position on the turntable. The cam at the right - the brake cam - is not a part of the cam assembly although it is attached to the cam shaft. It stretches and releases a "brake spring" and has a profile shaped so the spring equalizes the forces required from the motor at different positions of the cam assembly thereby assuring smooth operation of the mechanism during transfer of the record.

CLUTCH OPERATION

The clutch is shifted by two springs and a series of levers that are parts of the trip mechanism assembly shown in Figure 9. It is linked to the clutch shifting lever and is lifted to the transfer position by the reset lever spring. The force of this spring is applied, upward, to the clutch shifting lever, through the reset lever and the adjusting screw that is in the reset lever.

When the mechanism is scanning or playing a record, the reset lever is held down by the

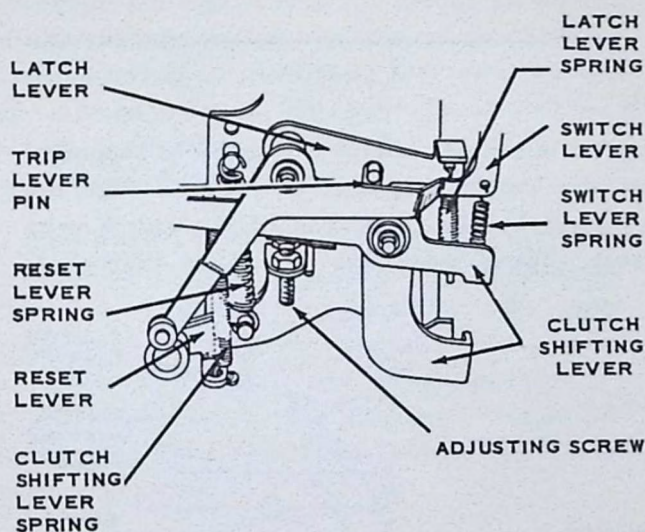


Figure 9.

latch lever and the spring is in its charged condition. When the trip solenoid is momentarily energized, it pulls the trip lever pin upward against the latch lever. When the pin hits the latch lever, the reset lever is released and the spring pulls the clutch upward so it engages the pin in the clutch worm.

During the ensuing record transfer operation and cam rotation, the reset cam moves the reset lever to its original latched position and the spring is again charged. This resetting of the trip mechanism begins as soon as the cam assembly starts to turn and is fully completed when approximately one-half the transfer operation is completed.

When the reset lever is returning to the reset position it can no longer hold the clutch shifting lever in the raised position. The clutch would then be lowered until it is no longer engaged with the clutch worm and the transfer operation would cease soon after it is begun. This is prevented by the clutch cam and the roller that is a part of the clutch shifting lever.

The clutch cam is the second from the left in Figure 8. The roller is between two side frame members of the clutch shifting lever and is above the cam assembly. The roller must be in the "scan notch" of the cam, as in Figure 10a, to permit the clutch to engage the sprocket. The roller, in this position, holds the cam assembly so it cannot turn from the scan position.

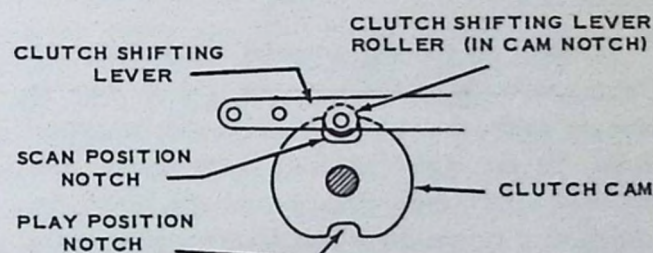


Figure 10a.

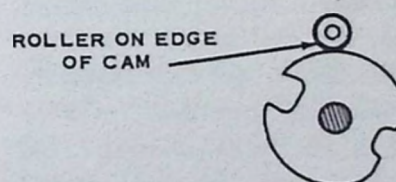


Figure 10b.

When the clutch rises to the transfer position, the clutch shifting lever roller lifts out of the notch. The transfer operation commences as soon as the clutch engages the pin on the clutch worm and, as the cam turns, the roller rides it as in Figure 10b. As long as the roller is on the outer edge of the cam it will hold the lever (and the clutch) in the transfer position.

As the transfer operation progresses, the reset cam, pushing on the reset lever, recharges the reset lever spring and, at the same time,

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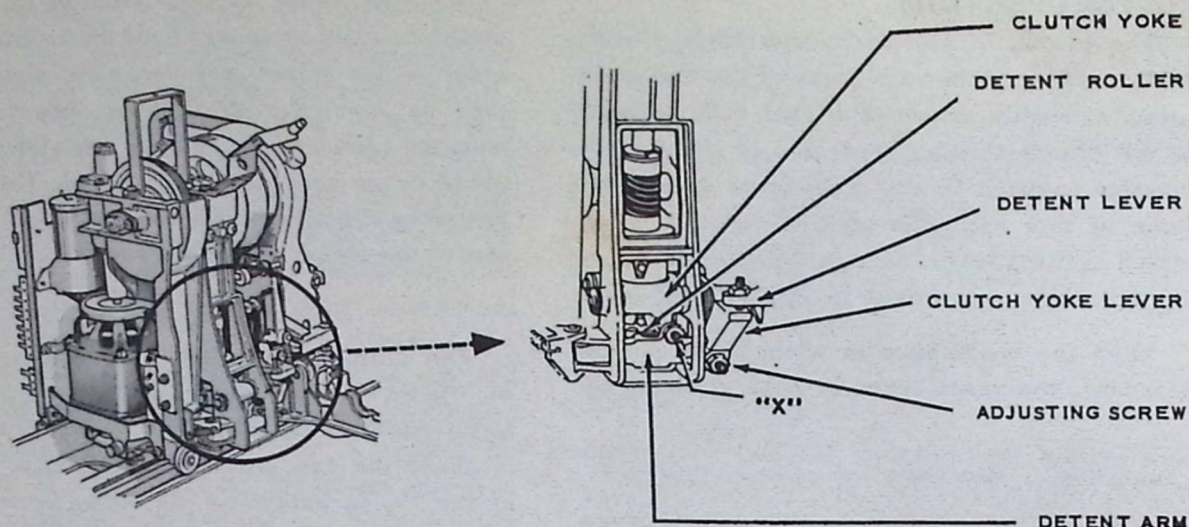


Figure 11.

charges the clutch shifting lever spring. This spring pulls downward on the clutch shifting lever so its roller is held firmly against the clutch cam.

In the continuing transfer operation, the "play position notch" of the clutch cam is brought under the roller and the roller is pulled down, by the clutch shifting lever spring, into the notch. As the roller enters the notch the clutch also moves down and disengages from the clutch worm so the cam assembly stops turning. The downward movement of the clutch is limited by a mechanism adjustment so it cannot engage the sprocket. When the clutch shifting lever roller has entered the notch, the cam assembly will have rotated one-half turn from its scan position and will be in its "play position", the carriage will be firmly detented at the selected record position, the record will have been transferred to the turntable and been clamped there, the pickup will be on the record and released so it can follow the record grooves and only the turntable is being driven by the motor. This is the "play position" of the mechanism.

CARRIAGE DETENTING

It is necessary to firmly detent and hold the carriage assembly at the selected record position while the record is being transferred to the turntable, played, then returned to the magazine. This is done by engaging a detent roller between two teeth of the sprocket that is at the lower

end of the clutch shaft. The roller is supported on the detent arm and is engaged with the sprocket by the lower end of the clutch yoke lever. These parts are shown in Figure 11.

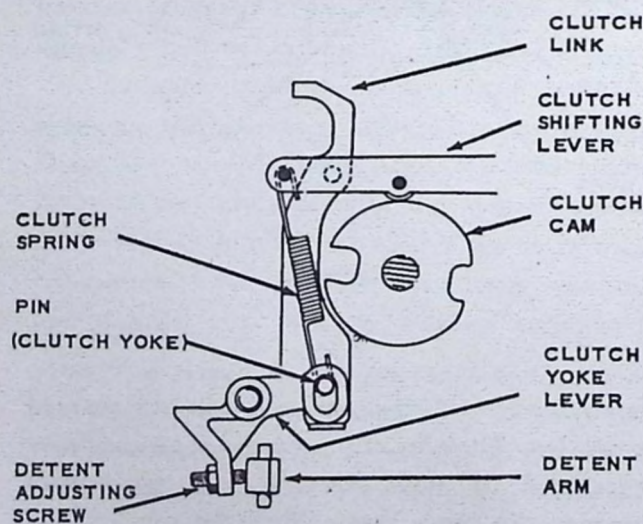


Figure 12.

Initial detenting occurs when the trip solenoid is energized and the clutch moves from the scan position to the transfer position. The upward movement of the clutch shifting lever lifts the clutch link and clutch spring, Figure 12, and the clutch yoke lever. The yoke lever pivots, bringing the detent adjusting screw against the detent arm so the detent roller engages the sprocket.

When the play position of the carriage is attained, the clutch shifting lever drops to

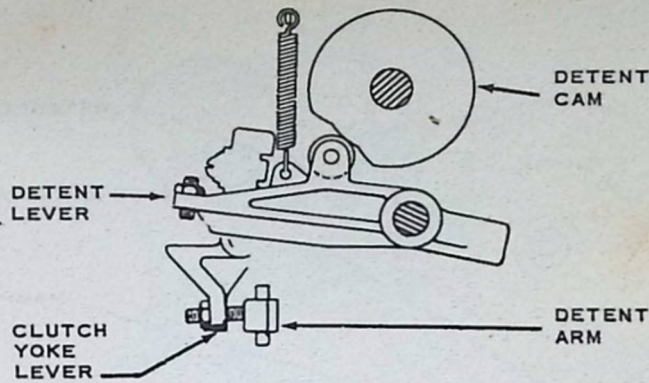


Figure 13.

disengage the clutch from the clutch worm. Its downward movement relieves the detenting force it applies to the clutch yoke lever but, before the release occurs, the yoke lever will be locked in the detenting position by the detent lever shown in *Figure 13*.

The detent lever is operated by the detent cam. These are shown in their scan position in *Figure 13*. As the cam turns from the scan position to the play position, the detent lever is driven downward so the adjusting screw at its end is against the flat horizontal part of the clutch yoke lever effectively locking the detent roller in position.

At the conclusion of playing a record, the trip solenoid again is operated so the clutch moves upward to the transfer position and again the clutch shifting lever supplies detenting force to the clutch yoke lever. In the ensuing rotation of the cam assembly to the scan position the detent lever is raised from the yoke lever so the detenting force is again supplied only from the clutch shifting lever. When the scan position is attained, the clutch drops and the detent roller is retracted from the sprocket so the carriage is free to scan.

Another function of the detent arm and the operations associated with it is retention of the clutch in its correct playing position while a record is playing. The adjusting screw in the detent arm, indicated at "X" in *Figure 11*, will move toward the clutch when the sprocket is detented and will be held firmly in position by the locking action of the detent cam and lever at the time the carriage cycles into the play

position. When the play position is attained, the clutch disengages but its downward travel is limited by the clutch yoke bearing against the adjusting screw. The length of clutch travel from the transfer position to play position is held to a minimum so the remaining available movement (from play to scan position) will afford the greatest possible displacement of the clutch shifting lever. By maintaining maximum movement of the clutch shifting lever between the scan and play positions, the adjustment for mechanical latch and release of the reverse relay will be less critical and a control switch it operates will be less critical in adjustment so positive contact functioning will be assured.

RECORD HANDLING

Record handling from the magazine to the playing position on the turntable and return to the magazine is performed by the transfer arm and the clamp arm. The record is rolled by the transfer arm from the magazine, upward on the ramp, to a position beside the turntable. After the record has been brought up to the turntable, the clamp arm centers it and clamps it in the playing position. At trip-off, when playing is concluded, the cam assembly rotation retracts the clamp arm to release the record and the transfer arm then lowers it to its original position in the magazine.

The transfer arm is controlled by the gear segment and cam shown in *Figure 14*. The segment pivots on the shaft at "A"; the arm pivots at "B". The gear segment spring biases the roller against the cam and lifts the head of the arm in an arc toward the turntable as the cam rotates from the scan to the play position. In the scan position the arm is below the record magazine. As it starts moving into the magazine, the roller in the head engages projections at the bottom of the adjacent separators so the arm centers in the record space.

As the arm moves upward, the record is rolled onto and up the ramp until the upward movement is arrested by the adjustment screw coming in contact with the stop plate. In this position, the record is cradled in the forked head of the transfer arm and the ramp and is slightly below its centered clamped position.

SELECT-O-MATIC "160" MECHANISM

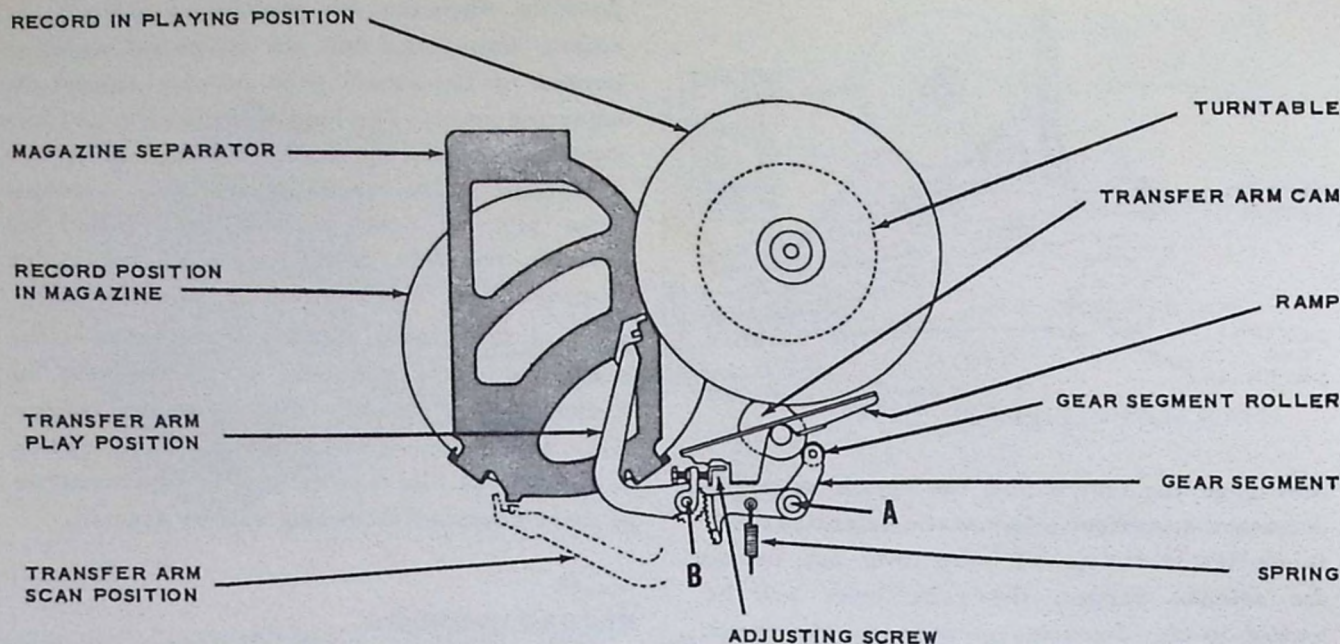


Figure 14.

As soon as the transfer arm and record are in the raised position, the clamp arm, *Figures 15 and 16*, moves toward the turntable and the cone and centering pin on the clamp disc passes through the record center hole. As the centering pin enters the hole in the turntable, the disc is aligned parallel with the turntable and the cone lifts the record so it no longer is touching either the ramp or the transfer arm. When the record is clamped, the transfer arm is retracted, slightly, to give additional clearance for the record rotation.

The clamp arm movement is controlled by the clamp arm cam. The arm pivots at "A" and is pulled toward the turntable by the clamp arm spring as the roller follows the cam during rotation from the scan to the play position. In the clamping position, the disc rotates with the record and turntable, with the ball on the pivot pin and the pivot block as a bearing.

Figures 15 and 16 show, respectively, the clamped positions for 45 r.p.m. records and 33-1/3 r.p.m. records. The "45's" have a 1-1/2 inch center hole and are lifted to the playing position by the centering cone of the clamp disc. The "33's" have 5/16 inch center hole and are lifted to playing position by the slope of the centering pin tip and by the lifting action of the

pin as it aligns with and enters the centering pin hole in the turntable. The 45 r.p.m. record is held against the turntable by the outer, flat surface of the disc while the 33's are held by the edge of the 45 r.p.m. record centering cone. In both, the records are against the turntable so their playing positions are the same and the only difference is in the position of the clamp arm. Its movement toward the turntable for 45 r.p.m. records is greater than for 33-1/3 r.p.m. records. This difference in movement is sensed by a clamp arm switch which controls, through a relay, the power to the mechanism motor and, thereby, the speed at which the record turns.

It will be noted that both the transfer arm and the clamp arm move to their play positions by spring force. If either is obstructed by any abnormal conditions, there are no damaging strains set up. It will be noted, too, that the record is "captive" in that it does not fully leave its magazine space for playing and cannot move past possible clamping position due to the stylus brush mounting frame. Lateral random movement of the record, before and after clamping, is prevented by the turntable and the stripper plate.

At trip-off, when the record is to be returned to the magazine, the cam assembly turns to the scan position. The clamp arm is first retracted from the turntable and the stripper plate "strips"

SELECT-O-MATIC "160" MECHANISM

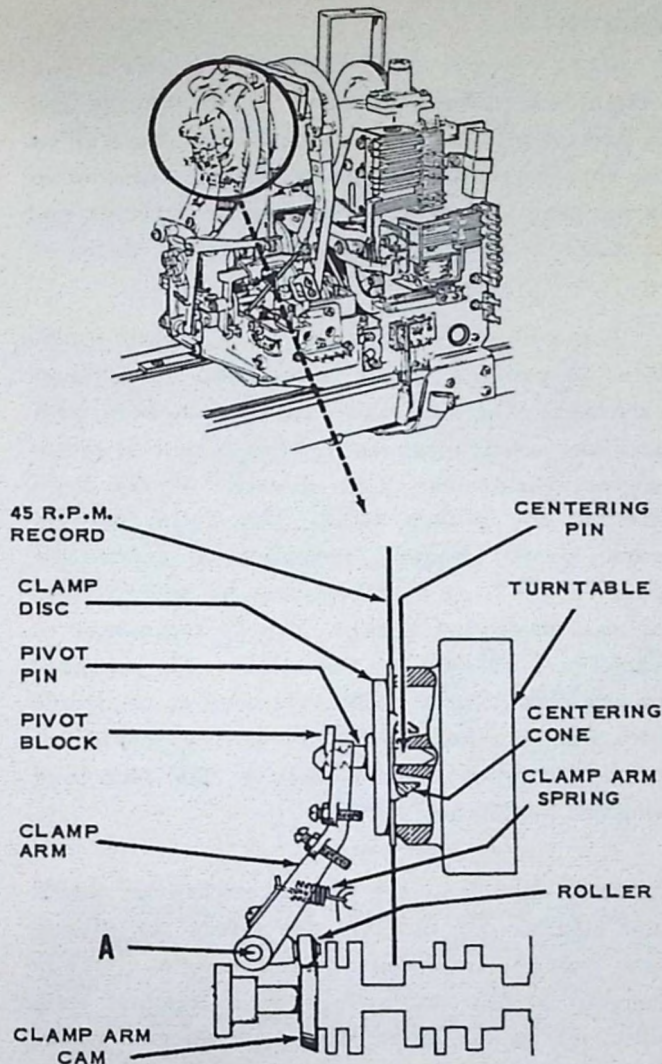


Figure 15.

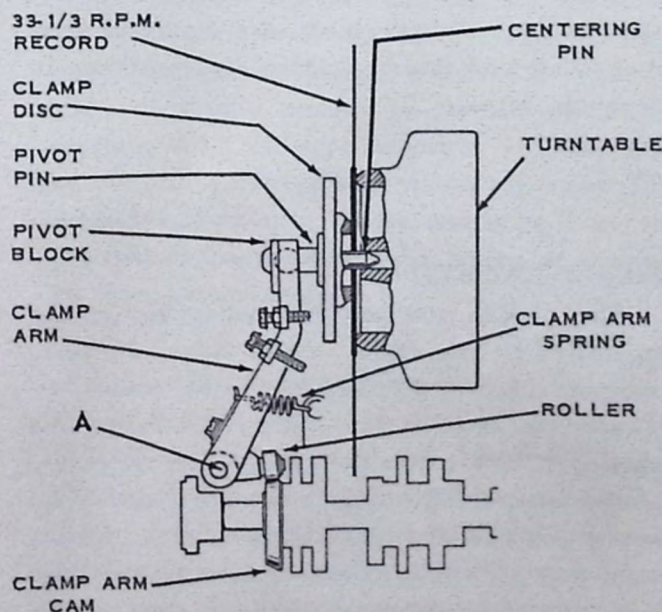


Figure 16.

the record from the disc so it drops to its former cradled position on the ramp and the transfer arm head. The transfer arm then lowers it to its stored position in the magazine space.

SAFETY PLUNGER

If a record is badly warped so it rubs on the magazine separators or for any other reason fails to return fully to its stored position in the magazine, the carriage will not scan to cause possible damage to the records or mechanism. The safety plunger, *Figure 17*, must move to its normal scan position, *Figure 18A*, before the carriage can start the scanning operation by engaging the sprocket. In this position the small diameter end of the plunger is in a notch in the stripper plate and the hook at the top of the clutch link (see *Figure 12*) has moved down past the large end of the plunger to permit the clutch to drop into its scan position.

In the play position the plunger has been moved by the detent lever and the safety lever so its large end is against the clutch frame as

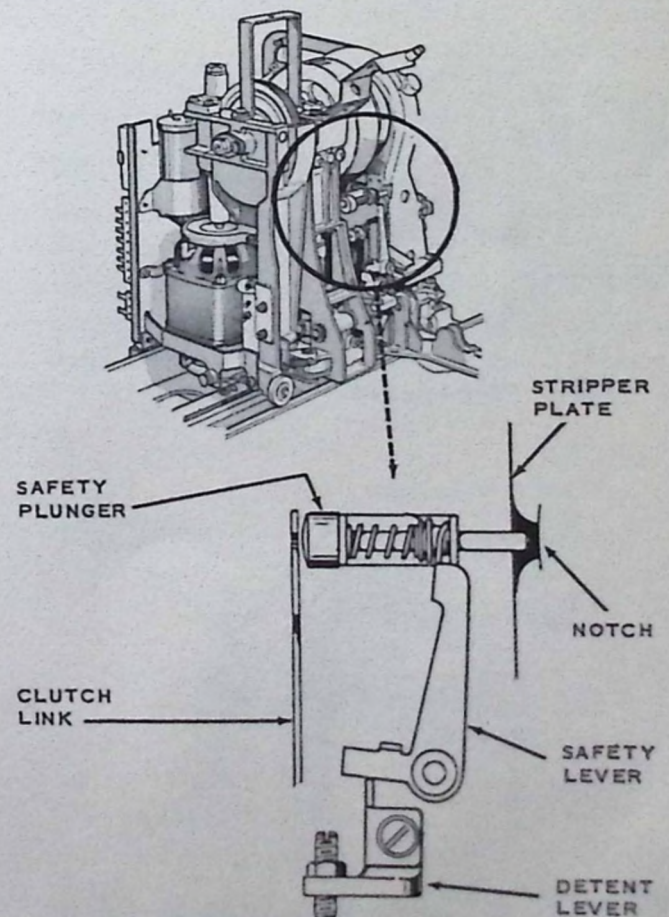
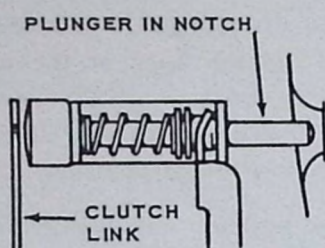


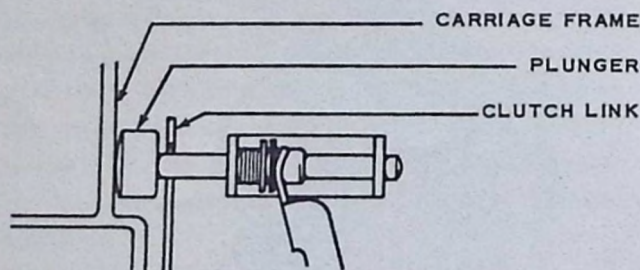
Figure 17.

shown in Figure 18B. In this plunger position the hook on the clutch link can move downward far enough to permit the clutch to move to the play position.

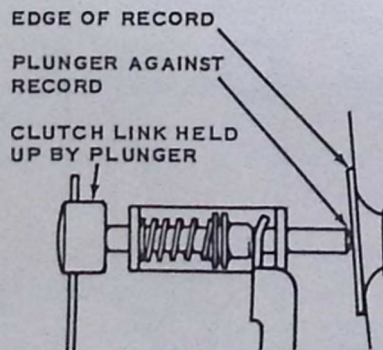
If a record is not returned to the magazine, it will block the path of the safety plunger from its scan position as shown in Figure 18C, and the hook on the clutch link will rest on the large end of the plunger. With the link held up by the plunger, it cannot drop far enough for release of sprocket detenting or engagement of the clutch and sprocket for carriage scanning.



(A) Normal Scan Position



(B) Play Position



(C) Record Not Returned To Magazine.

Figure 18.

PICKUP

A two-channel stereo pickup with two stylus assemblies plays both sides of the records and is part of a pickup arm system that is moved to the record side that is to be played. The pickup is a magnetic type with replaceable styluses and operates with stylus pressure on the record of $4\frac{1}{2}$ to $5\frac{1}{2}$ grams.

The stylus tips are mounted in plastic armature assemblies which slide into the pickup cartridge. The magnetic circuits include both armature assemblies so that movement of either stylus varies the flux density of the field through the pickup coils. The coils, one for each stereo channel, terminate at connecting pins in the base of the pickup for plug-in connection through a socket. The dc resistance of each coil is 600 to 800 ohms. The nominal pickup output for a 1000-cycle tone at amplitude of 5.5 cm/sec peak lateral level is approximately 4.5 mv when connected to a 7000 ohm load shunted by 250 mmf.

The leads from the pickup socket are small and flexible so they do not affect the pickup arm balance and the stylus pressure. They connect to four solder-lugs on a terminal strip which is on the front of the pickup arm cradle frame. Two single-conductor, shielded leads extend the two pickup circuits to single-contact plugs for connection to the phonograph amplifier. The shields of these leads are insulated from each other and the mechanism to avoid hum in the audio output.

PICKUP ARM SYSTEM

The pickup arm position and operation are controlled by two cams. One of these, the pickup cam, places the stylus on the record, releases the arm so the stylus can follow the playing grooves, lifts the pickup from the record at conclusion of playing, returns the arm to the at-rest position and locks it there, ready for the next playing cycle. The other, the shift cam, positions the arm to the left or right of the record to be played for, respectively, left or right side playing.

The movement of the arm as the pickup moves to and from the record and as it follows the irregularities of a warped record has at its axis, at the lower end of the arm, a damping system shown in Figure 19A. The arm pivots on a thin

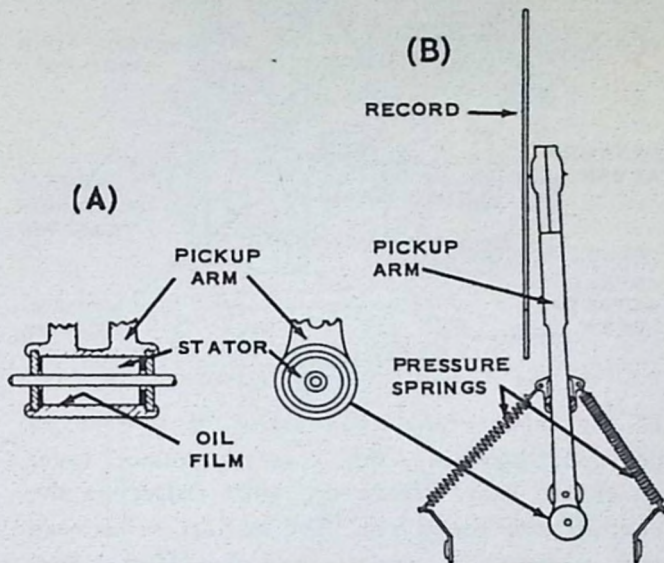


Figure 19.

film of viscous oil that is between the bore of the arm and the stator. The stator, as its name implies, does not turn — it is held rigidly between two centering screws in the cradle shown in Figure 20.

The stylus pressure against the record and the arm movement toward the record is obtained from the pressure springs, Figure 19B. When the right side of a record is played, the arm is positioned at the right as shown and the spring at the left provides the stylus pressure. When the left side is played, the arm is positioned to the left of the record so the spring at the right provides the pressure.

The axis of lateral movement of the pickup arm (movement parallel to the record surface) is through the pickup cradle at the pivot sockets, Figure 20. The pivots are hardened steel points in the cradle frame, Figure 21. The pivot at the right is fixed; the one at the left is moveable so it can be adjusted for free movement of the cradle with neither binding nor undue looseness.

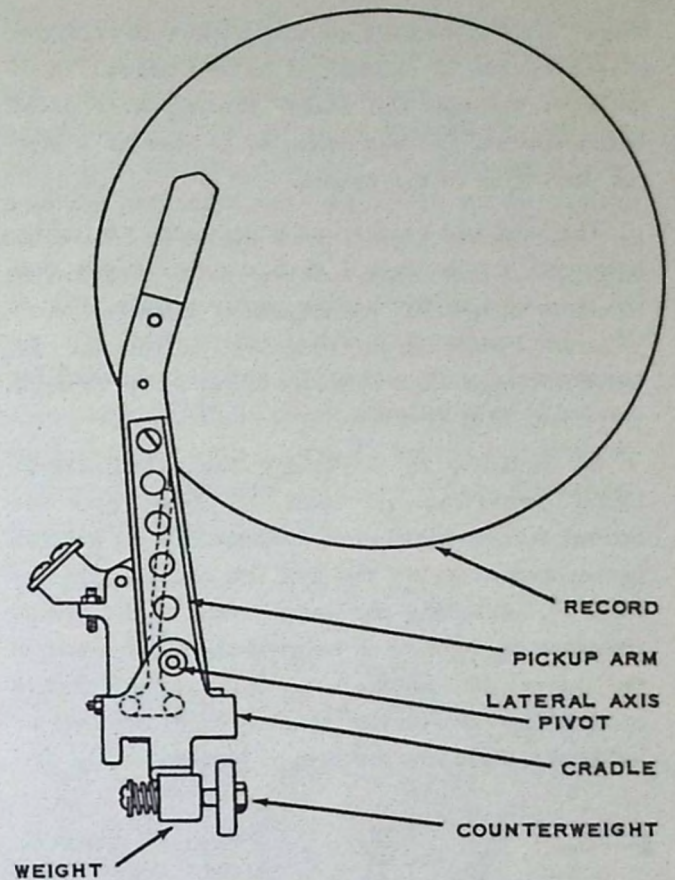


Figure 20.

The lateral movement is limited in both directions. The limit of pickup travel toward the edge of the records is controlled by the adjusting screw A, Figure 22, and is established at the point at which the stylus lands on the record at the start of play. The screw is in a projection of the pickup cradle and moves downward in an arc until it stops against the cradle

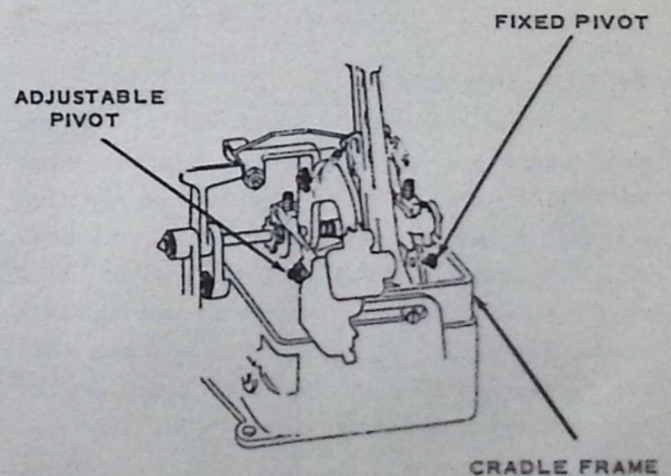


Figure 21.

frame. The movement of the pickup toward the record center is controlled by the screw, B. It projects through the frame casting at a point below the axis of movement so it acts as a stop for the swing of the cradle.

The arm and cradle, as a unit, are statically balanced by a weight and counterweight that are attached to the bottom of the cradle, *Figure 20*. The weight is fixed in its position but the counterweight is moveable and is adjusted for correct lateral balance.

In addition to balancing for static conditions, provision is made to counteract the lateral forces developed dynamically by friction between the stylus tip and the record. This is done by anchoring the lower ends of the stylus pressure springs at a point that is off-set from the lateral axis of the arm so the spring that is in tension opposes the dynamic force as well as holds the stylus in the record groove.

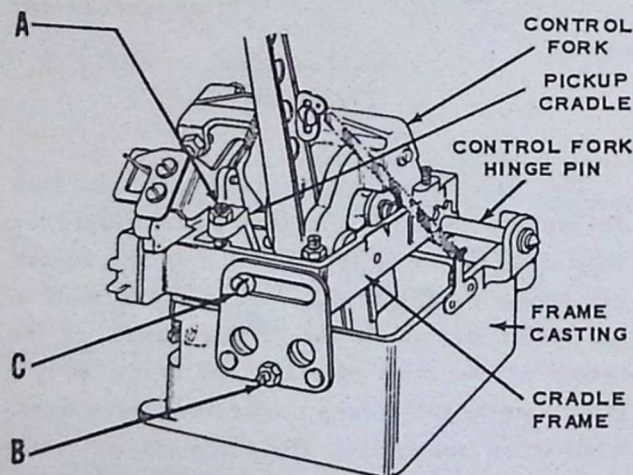


Figure 22.

PICKUP ARM SHIFT

The cradle frame in which the pickup arm and cradle are held is mounted in the frame casting, *Figure 22*. It is supported on the control fork hinge pin and the screw, C, the head of which rests in the slotted plate at the front of the casting. The assembly is moved, as a whole, to the left or right, by the pickup shift cam operating through the drive crank, cradle actuator lever, and shift collar, *Figure 23*.

In the assembly shifting operation, the shift cam rotation direction determines the position

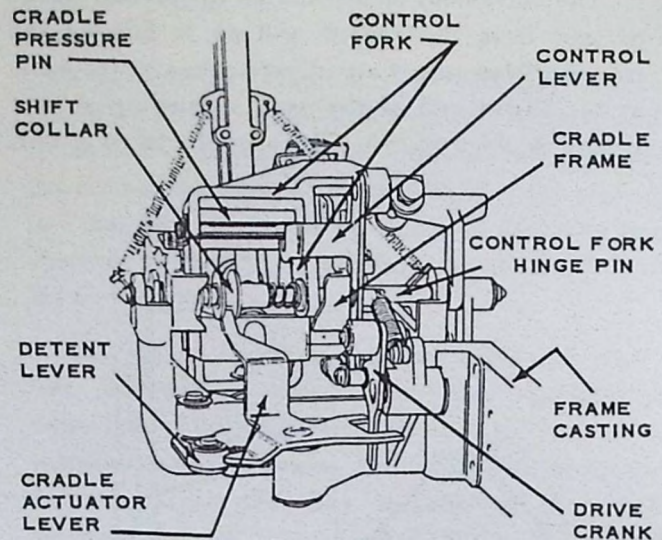


Figure 23.

of the drive crank. The crank, if it changes position, operates the cradle actuator lever which, in turn, slides the shift collar on the control fork hinge pin. The collar is between two compression springs and the control fork so, when it moves, the control fork and the cradle frame, together, slide with it along the pin until the frame comes to a stop against projections that are at the back of the frame casting.

The movement imparted to the cradle actuator lever by the drive crank is supplemented by the detent lever, *Figure 23*. In conjunction with the actuator lever, it performs an over-center action that moves the shift collar farther than the stops on the frame casting will permit the cradle frame to move. This over-travel of the collar is absorbed by the compression springs and assures full positioning of the pickup arm to the left or right side playing position. It also holds continuous but controlled force against the control fork and the cradle frame to eliminate possibility of vibration of the assembly.

The drive crank changes position and moves the pickup arm only if the record side next to be played is opposite that of the record side last played. *Figure 24A* explains this operation and shows the shift cam and the drive crank in their relative scan positions after the left side of a record has been played. In this view, the cam and crank are shown in their relative positions as though viewed from the clamp arm side of the carriage assembly.

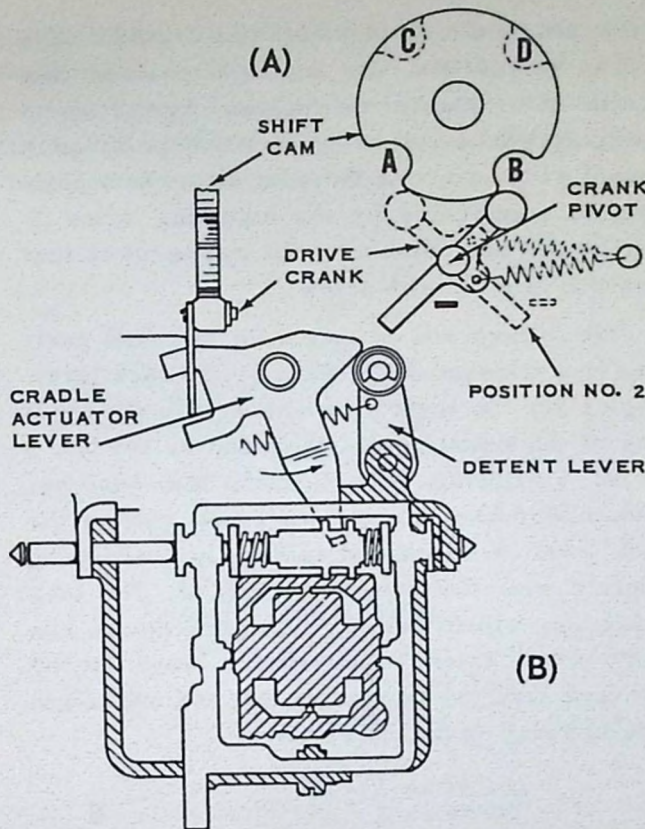


Figure 24.

If, on the next play, the right side of a record is to be played, the cam will turn clockwise in the record transfer operation. After a few degrees of cam rotation the roller on the drive crank will fall into the notch, B. As the cam continues to turn, the notch, B, will move to its play position at C with the roller following it until the crank is at position 2. When the crank is in this position, the pickup arm and the levers are positioned as shown in Figure 24B.

If, on the next play, the left side of a record is to be played, the cam will turn counterclockwise from the position shown in Figure 24A and the notch, A, will pass the roller of the drive crank. The roller is momentarily in the notch but there will be no change of position of the crank relative to the cam and the pickup arm position remains unchanged.

PICKUP ARM OPERATION

The pickup arm operations at the beginning and end of record play are performed by the control fork. The fork is actuated by the pickup cam and the control lever and is shown in its play

position in Figure 25. In this position, the control lever spring holds the control lever roller in the cam notch and the control fork, through coupling with the lever at the cradle pressure pin, is in its play position. As the cam rotates from its play position, the roller on the control lever moves to the longer cam radius and the control fork pivots on the hinge pin to its scan position. While moving from play to scan position, the pickup is lifted from the record, the arm and cradle are then moved to and locked in their scan position. While moving to the play position, the fork lowers the pickup to the record, then releases the arm and cradle so the stylus can follow the record grooves.

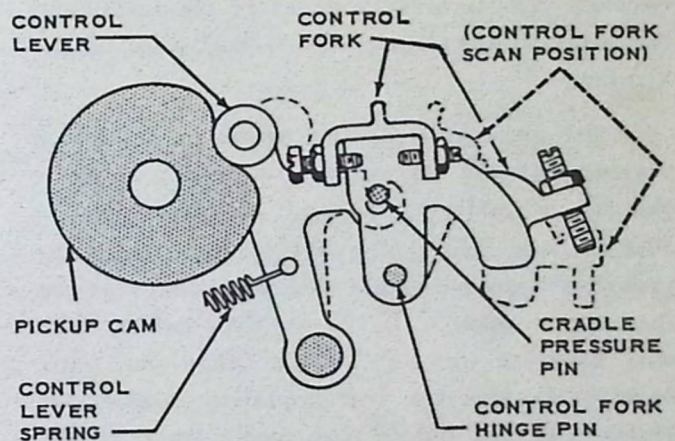


Figure 25.

The pickup is moved to and from the record surface by the forked downward extension that gives the control fork its name. In the scan position, one or the other of these extensions bears against a roller, that is in the pickup arm above its pivot axis in the cradle, and holds the pickup away from the record. Figure 26 shows

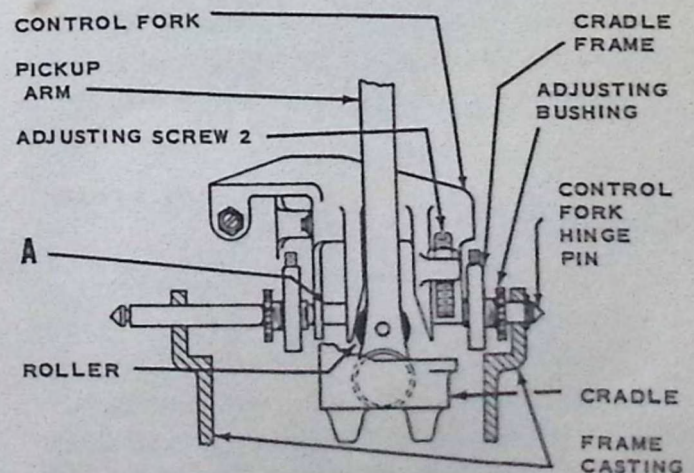


Figure 26.

the fork and pickup arm with the fork in a position approximately half way between scan and play and with the pickup arm at the right side of a record. In this illustration the fork extension at the left is against the roller in the arm and, if it is moved downward to the scan position, it will press against the roller and move the pickup away from the record. If the fork is moved upward to the play position from the position shown, it will fully clear the roller and the pickup arm will be released so the stylus will rest on the record.

Negligible force for lateral movement is imparted to the pickup arm by the lifting operation because the point of contact of the roller and the control fork is on the lateral axis of the system.

If the pickup arm is in position for right side playing and the left side of a record is to be played, it will be shifted as discussed in Pickup Arm Shift. The shift collar and compression spring (Figure 23) will push against the control fork at A, Figure 26, and the fork will move to the left on the hinge pin, until bearing against the left adjusting bushing, it shifts the arm, cradle and cradle frame to the left in the frame casting. As the fork moves from the right to the left side of the cradle frame, the fork extension at the left moves away from the pickup arm roller and the one at the right moves against it. The arm then tilts to the left for pickup clearance with the left side of the record.

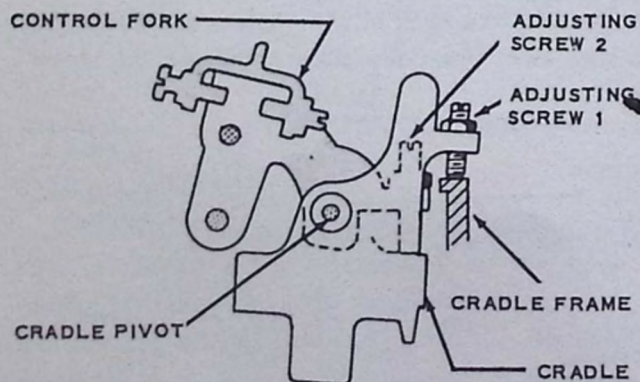


Figure 27.

Return of the pickup and cradle from the released, record-playing position to the scan position occurs when the adjusting screw 2 in the control fork, Figures 26 and 27, presses

downward on the forward edge of the cradle. The pickup moves with the arm to a position that places the stylus where, without lateral movement, it can move to its starting point on a record at the start of the next play. This position is established by the adjusting screw 1, Figure 27, and adjustment for movement to that position is made with screw 2.

The pickup arm is locked in the scan position and released for playing by the lock lever, Figure 28. The lever pivots at A when the upper end of the control crank is moved by the No. 3 or No. 5 adjusting screws. In the play position, shown in Figure 28, the horizontal part of the lock lever is raised and is held in position by contact with the detent lever at B. The lock lever pin which extends from the cradle can move freely beneath the pointed projection on the lock lever so the pickup arm and cradle are free to swing on the cradle pivots.

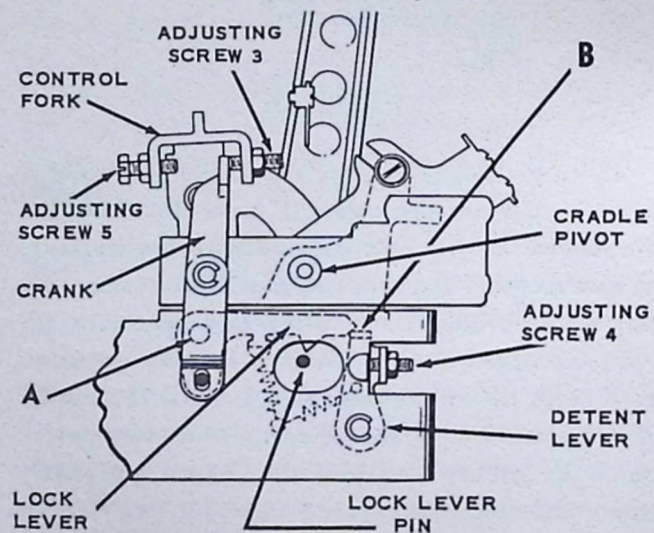


Figure 28.

When the control fork moves to the scan position, the cradle and pickup arm are first moved to their scan position and the lock lever pin is positioned back of the point on the lock lever. When the fork has moved almost fully to its scan position, the No. 5 adjusting screw, presses against the control crank and drives the lock lever downward, past the detent lever, to the scan position shown in Figure 29. The lock lever, in the lowered position, securely holds the lock lever pin (and the pickup arm) in the scan position and is again detented by the detent lever. The force or pressure of detenting is

controlled by the tension of the spring that holds the lever toward the lock lever but the No. 4 adjusting screw, in contact with the frame casting, limits the detent lever movement and determines the point of contact of the two levers.

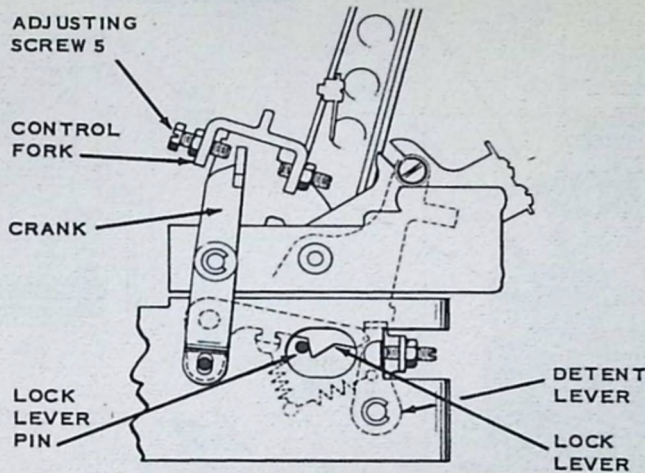


Figure 29.

The pickup arm remains locked in the scan position until, in the next record playing cycle, the control fork has moved almost fully to its play position and the pickup stylus has been placed on the record. The No. 3 adjusting screw then presses against the control crank and lifts the lock lever past the detent lever, to the position shown in Figure 28, so the pickup is released for playing.

MOTOR

All phases of operation of the carriage assembly — scanning, transfer of the record to and from the turntable, and playing — are accomplished with a motor that is mounted on the carriage assembly. It is a 117 volt A.C., split phase capacitor type of approximately 1/100 h.p. The normal motor speed for record playing at 33-1/3 r.p.m. is 1745 r.p.m. with 60-cycle power. During scanning and when a record is being transferred, more torque is required of the motor and is provided for in these operations by connecting additional capacitance across the permanently connected capacitor. This is done with the "O" contacts of the cam switch that are closed except when the carriage is in the play position. The circuit is shown in Figure 31.

PLAY CONTROL

The Play Control Assembly controls, through two pairs of contacts, the 117-volt power to the mechanism motor and an audio control circuit which is associated with remote control Wall-O-Matics. It turns on the power when selections are made and turns it off after the records have played. It consists of two pairs of normally open switch contacts actuated by a ratchet that, in turn, is controlled by momentary operation of an add solenoid and a subtract solenoid. The ratchet is moved fully to the switch-on position each time the add solenoid operates. Two operations of the subtract solenoid are required to reset the ratchet to the position in which the switch is open.

The add solenoid is momentarily energized when a selection is made with the electrical selector or by remote control through the stepper assembly. The subtract solenoid is momentarily energized through the subtract switch on the mechanism. The subtract switch is operated when the carriage is scanning to the left past an actuator which is positioned a few inches from the left end of the base.

33-1/3 r.p.m. — 45 r.p.m.

The phonograph motor operates at supply line frequency when 33-1/3 r.p.m. records are played. As shown in Figure 31, it connects to the line through the Auto-Speed Unit and its power control relay and is turned on and off by the play control switch in the Tormat Control Center of the phonograph. The Auto-Speed Unit is an a.c. - to - a.c. converter which supplies motor power at approximately 80 cycles when a 45 r.p.m. record is played. The motor is transferred to the higher frequency by energizing the power control relay.

The relay operates at 25 volts through the mechanism clamp arm switch, the IC contacts in the reset lever switch and the P contacts in the cam switch. The IC and P contacts are closed when the mechanism is in playing position but the circuit is complete only if the clamp arm has moved far enough to close the clamp arm switch. This occurs only when a 45 r.p.m. record is clamped.

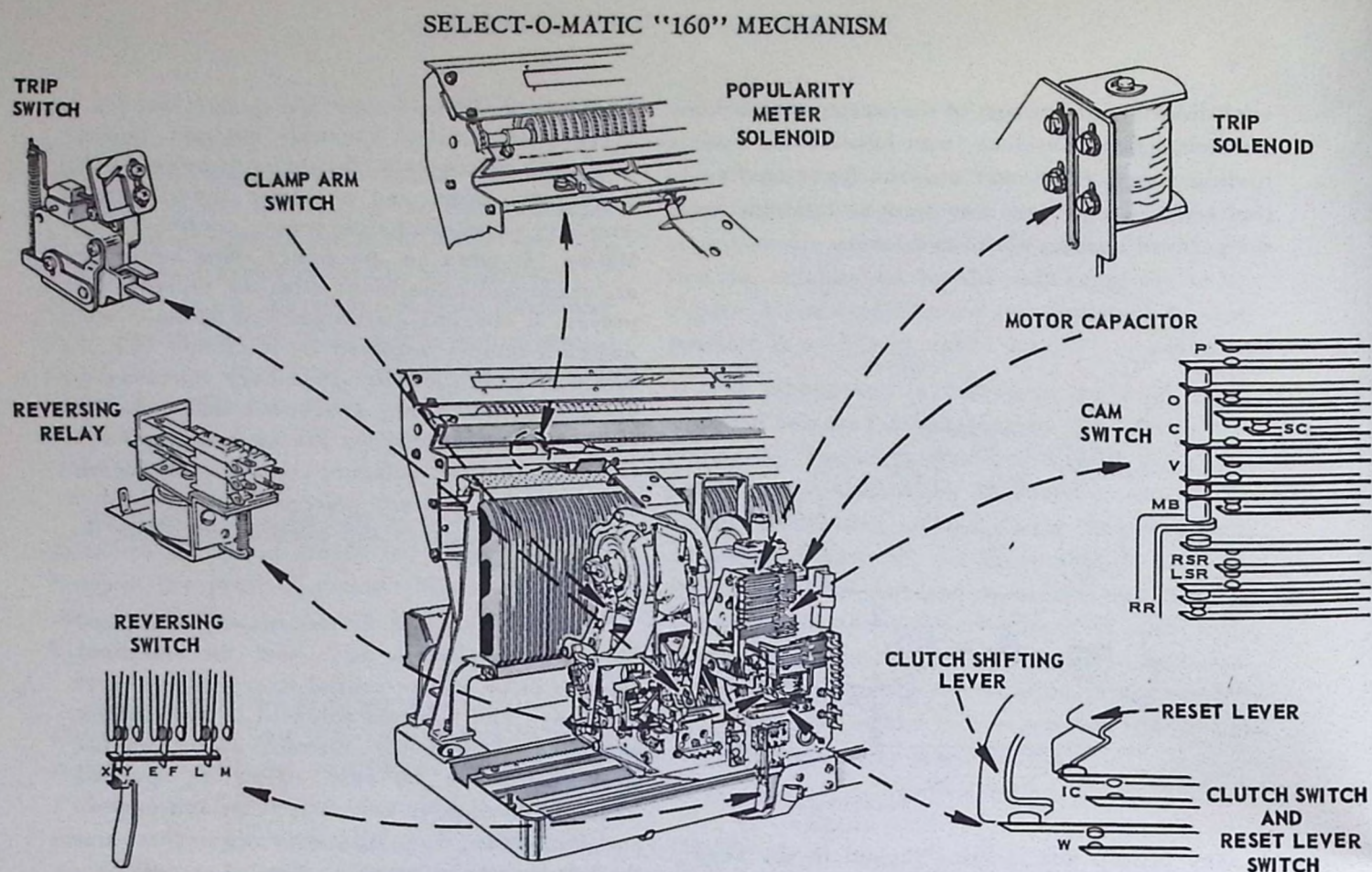


Figure 30. Mechanism Component Identification.

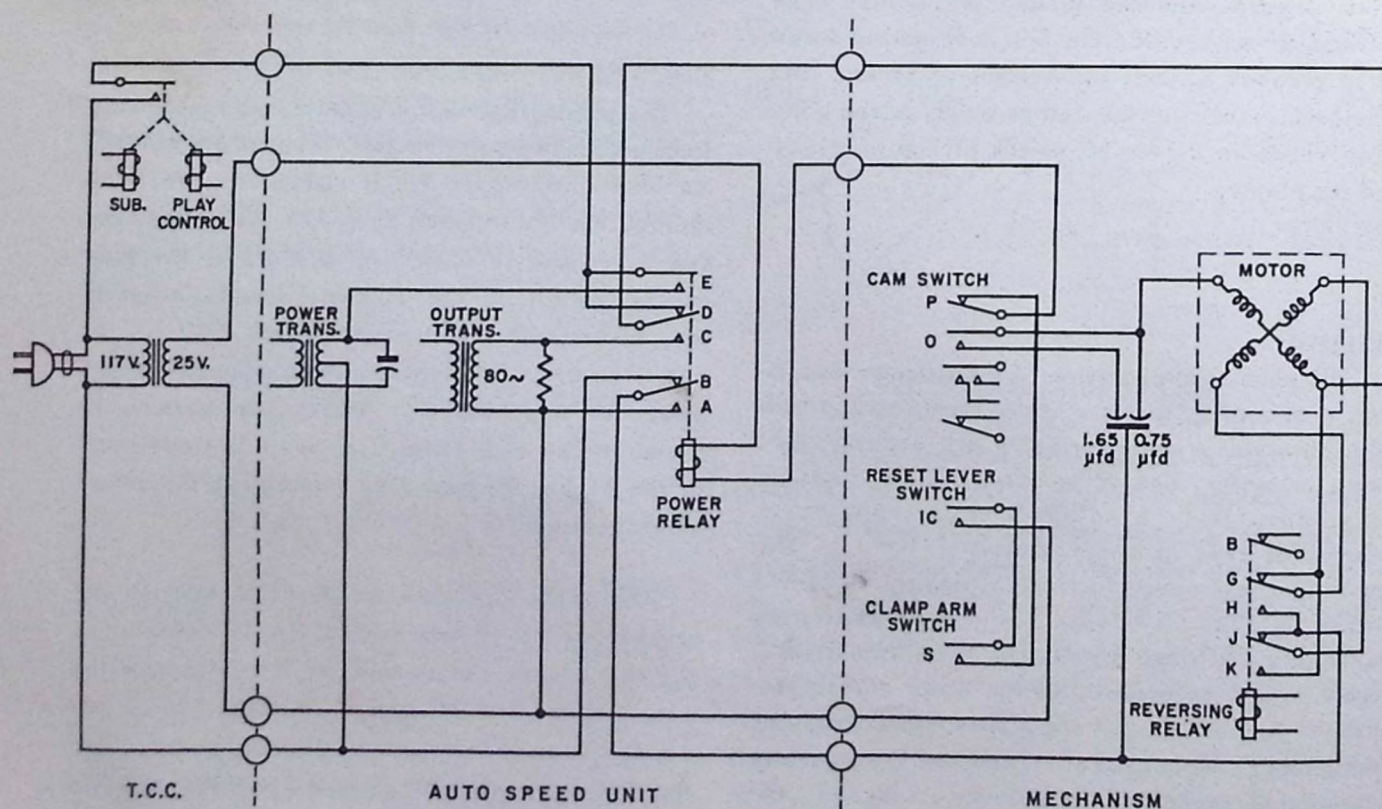


Figure 31. 25-volt Motor Control Circuits.

SELECT-O-MATIC "160" MECHANISM

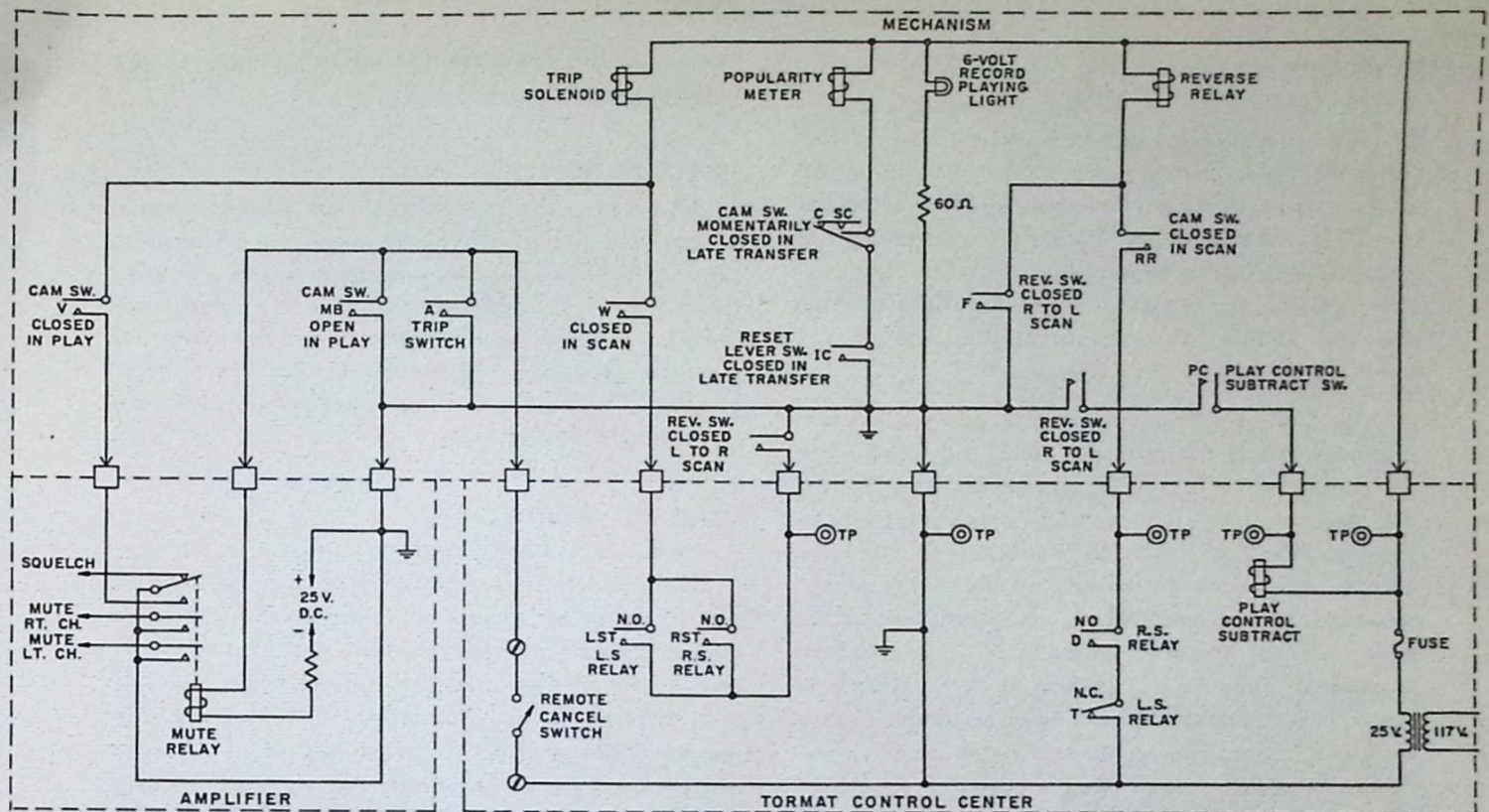


Figure 32.

REVERSING RELAY

The change in direction of scanning and of the turntable for playing the left or right sides of the records requires a change in direction of motor rotation. This change is made with contacts on the reversing relay which is on the carriage. As shown in Figure 31, it reverses the connections to one of the motor coils. The motor rotation, with the relay not energized, is such that the records turn clockwise (for left-side play) and the carriage scans to the right.

The relay coil circuit is shown in Figure 32. It is energized through contacts on a reversing switch for change of scanning direction. The switch is mounted on the carriage and is actuated by "stops" at each end of the base. The switch is closed and the relay energized when the carriage has scanned fully to the right. It is open and the relay de-energized when the carriage has scanned fully to the left.

Contact RR in the carriage Cam Switch and contacts D and T on, respectively, the Right Side and Left Side Relays in the Tormat Control Center control the relay for right side record playing.

TRIP SOLENOID

The Trip Solenoid is energized at 25 volts,

a.c., to detent the carriage at a selected record and start transfer of the record to playing position. It is energized a second time in the record playing cycle when the record is to be returned to the magazine. The circuit is shown in Figure 32.

The first operation in which it "trips to play" is initiated by the LST or RST contacts on, respectively, the Left Side Relay and Right Side Relay. The relays control the circuit only when the carriage is scanning from left to right at which time contact E on the Reversing Switch and contact W on the Clutch Switch are closed.

The second operation of the trip solenoid, by which a record is returned to the magazine, occurs when the mute relay in the phonograph amplifier is energized by closing either the mechanism trip switch or a manually operated remote cancel switch. The trip solenoid circuit is through the mute relay trip contacts and contact V in the cam switch. Contact V is closed only in play position and isolates the solenoid until, in normal mechanism operation, the mute relay is no longer energized. The contact closes at about the time the pickup is placed on a record which is being transferred to the playing position and reopens immediately after start of record transfer to the magazine.

MUTE RELAY

The mute relay is in the phonograph amplifier and operates at approximately 25 volts d.c. supplied from the amplifier. Its functions are muting the amplifier by grounding the signal circuits, control of the amplifier squelch operation and initiating mechanism transfer of a record from playing position. It is energized through the trip switch, the remote cancel switch and the MB contacts in the cam switch.

The trip switch is operated by the pickup arm. It closes when the pickup has moved to the cut-off radius on a record and remains closed until the pickup arm is reset to its scan position. It is paralleled by the MB contacts of the cam switch which are open only in mechanism play position so the mute relay is energized during both record transfer operations and carriage scanning. This is necessary in the muting and squelch functions and continued or unnecessarily prolonged operation of the trip solenoid is avoided by opening the solenoid circuit at the V contacts.

POPULARITY METER

The popularity meter indicates the number of times (up to forty) each record has been played. It is operated by a 25 volt solenoid with power supplied from the Tormat Control Center. The circuit, shown in *Figure 32*, is closed if both the IC contacts in the reset lever switch and the C and SC contacts in the cam switch are closed.

The C and SC contacts are make-and-break. They are closed momentarily at about the time the pickup is placed on the record in the transfer-to-play operation and again immediately after the start of transfer of the record to the magazine. They operate by force that is applied to them by the cam switch lever and are adjusted so they do not close until after the V contacts have closed. The IC contacts are operated by the reset lever and are closed when the trip mechanism is in its reset position.

The trip mechanism is released at the beginning of a record transfer operation and reset when the operation is approximately half completed. The circuit, then, is complete at the IC contacts at the time the C and SC contacts close during the transfer-to-play operation but it is open at the IC contacts when the C and SC contacts close during the transfer of the record to the magazine. There is, then, only one solenoid operation in each record playing cycle and it

occurs at the time the record is brought to the playing position.

MUTING CIRCUIT

There is the possibility of objectionable noise output from the phonograph sound system arising from mechanism operation when a record is not being played. This is overcome by grounding the amplifier signal circuits except when the carriage is in the play position. This is accomplished through the muting contacts on the mute relay in the amplifier.

SQUELCH CIRCUIT

(Automatic Volume Compensation)

The amplifier associated with the mechanism has an automatic volume compensation circuit that maintains nearly constant the average volume of sound from the phonograph regardless of the difference in "loudness" of the records played. The circuit is also used to sharply reduce the gain of (squelch) the amplifier during the time that records are not being played. The advantage of this is the elimination of the "pop" or thump that can be developed when the pickup stylus lands on the record just before playing commences.

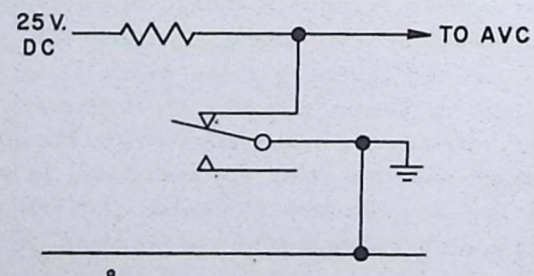


Figure 33.

The amplifier signal is squelched when a bias of approximately 25 volts is applied to the AVC circuit and released when this bias is removed. The bias is controlled with the squelch contacts on the amplifier mute relay. The contacts are closed to ground the bias and the AVC circuit when a record is playing. The circuit is shown in *Figure 33*. The resistor shown limits the loading on the amplifier when the contacts are closed.

The change in amplifier gain and resultant volume change is not abrupt; it requires four to eight seconds to attain final values as the squelch switch opens or closes.

SELECTION SYSTEM

The Tormat Memory System is a selection system in which magnetic cores of magnesium ferrite and three functional electrical circuits are the basic elements for control of the mechanism. There are one hundred and sixty cores — one for each record side — arranged in an electrical matrix that stores or "remembers" the selection information that is fed into it when selections are made at the phonograph with the Electrical Selector or by remote control with a Wall-O-Matic. The cores are toroid-shaped and are referred to as toroids in their application in the selection system. It is from this name, TORoid, together with the MATrix arrangement and the "remembering" function that the "Tormat Memory System" name has been derived.

The toroid matrix is assembled in the Tormat Memory Unit that is mounted on the back of the mechanism. This Unit, the Electrical Selector, the mechanism control circuits, a contact plunger block on the mechanism carriage, and the associated electronic circuits comprise the selection system.

The toroids are arranged in the Memory Unit in two rows of eighty each, and spaced so there is one in each row at each magazine record space. They are mounted in molded bakelite blocks and are held in position by a locking plate and internal circuit wiring. The wiring terminates at solder lugs in the Unit that serve

as junctions for the cables that connect to the rest of the system. Some of the internal circuits terminate at contact rivets and the continuous contact bar that are on the bottom of the Unit. Contact with the rivets and the bar is made with the contact plunger block that moves with the carriage in the scanning operation of the mechanism. The Memory Unit and contact block are shown in Figure 34.

Each toroid has two normal states of magnetization in which the residual magnetic flux is in either clockwise or counter-clockwise direction. One of these states is called zero or no-selection. The other is the selected state. If undisturbed by a magnetic field, they will retain, indefinitely, either state.

When a selection is made, a pulse of current is passed through wires threaded through the appropriate toroid. The resultant magnetic field changes the magnetization from the zero — not selected — state to the selected state. The process of changing a toroid to the selected state is called "write-in". The circuits associated with it are the write-in circuits.

If a write-in pulse is passed through the circuit of a toroid that is in the selected state, no change of magnetization takes place — the toroid continues to be in the selected state.

When the selection information that has been written into a Memory Unit toroid is to be used for control of the mechanism, a pulse of current is passed through another wire that is threaded through the toroid. This current is of opposite phase with respect to the write-in current and produces a magnetic field that can restore the toroid magnetization to the zero state. This operation is called "read-out" and the associated circuit is the read-out circuit. The term is used and applies whether the state of the toroid is or is not changed although no change of magnetization state takes place if a toroid is in the zero state at the time the current is passed through the circuit.

Wire of a third circuit is threaded through the toroid. This is an output loop of the Tormat Memory Unit and is part of what is known as a sensing circuit of the system. The loop connects to a filter and pulse transformer in the sensing circuit where one side is grounded. This

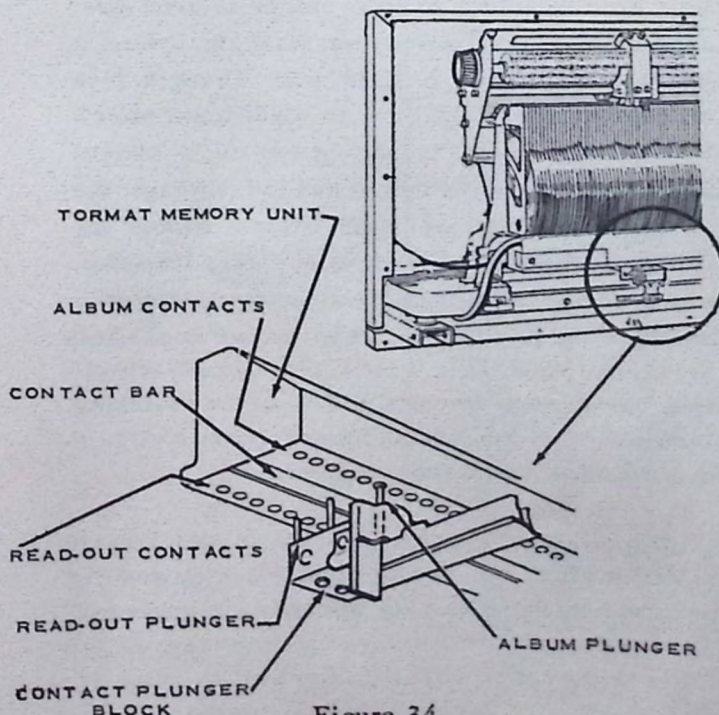


Figure 34.

load of filter and transformer is represented as a resistor in *Figure 35*. A voltage is induced in the loop and appears across the load each time a current pulse is passed through either the write-in or read-out circuit that threads the toroid. The direction of the write-in and read-out currents in these circuits is indicated in *Figure 35*. The voltage appearing across the load will be positive (with respect to ground) when the write-in circuit is pulsed, negative when the read-out circuit is pulsed. If the output pulse is negative and if it has sufficient amplitude, it operates the sensing circuit of the system so a control relay and the trip solenoid of the mechanism will be energized and begin a record playing cycle.

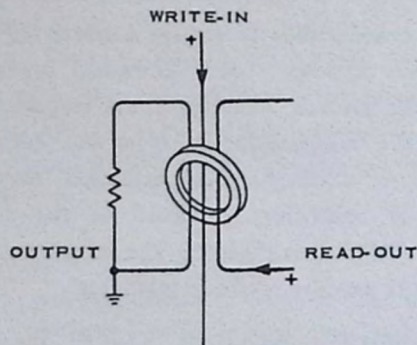


Figure 35.

The operating conditions in the Memory System are such that the change of magnetization state of a toroid is very rapid. The voltage appearing across the output loop load due to this rapid change is several times greater than the voltage that is developed when no change of state occurs. This has no significance in the write-in operation, for the output pulse is positive whether or not the toroid changes state and does not affect the sensing circuit. It is important, however, in the read-out operation because the sensing circuit is designed to operate (a control relay) only if the voltage developed in the loop is the result of a toroid change from the selected to the zero state.

Figure 36 shows the basic circuits of the Tormat Memory System in simplified form. The current pulses for write-in and read-out are supplied by discharging capacitors through their respective associated circuits. The condenser charging current is supplied at 300 volts from a voltage regulated power supply. When a selec-

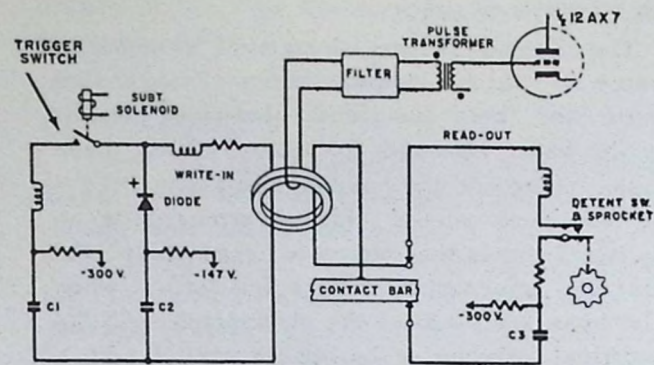


Figure 36.

tion is made, the write-in condenser, C1, is discharged by closing a "trigger switch" with a credit subtracting solenoid in the Pricing Unit that is part of the credit system of the phonograph. The amplitude of the pulse is accurately controlled, to a predetermined value, by the clipping action of the diode and the condenser, C2, that is charged to 147 volts. The read-out condenser, C3, is discharged at each magazine record space by the detent switch that is operated by the mechanism clutch sprocket. The output loop is connected to the 12AX7 tube in the pulse amplifier through the filter and pulse transformer previously discussed.

WRITE-IN CIRCUIT

The magnetic field that changes a toroid from zero to select or from select to zero must exceed a critical density or strength before it becomes effective. A field with strength less than the critical value has no significant effect. Because the field is the result of a current pulse through a circuit threaded through the toroid, no change of state occurs unless the current exceeds a critical value. This behavior, which is due to a characteristic of the material of which the toroids are made, makes it possible to arrange them in a matrix that greatly simplifies the write-in circuits and write-in switching. Instead of one hundred and sixty write-in circuits and switches there are twenty-eight.

The diagram, *Figure 37*, shows the 8-by-20 (=160) matrix, the twenty-eight circuits and the switches associated with the write-in operation. The circles at the points of intersection of the letter and number circuits represent the toroids. Any toroid may be identified in reference to the

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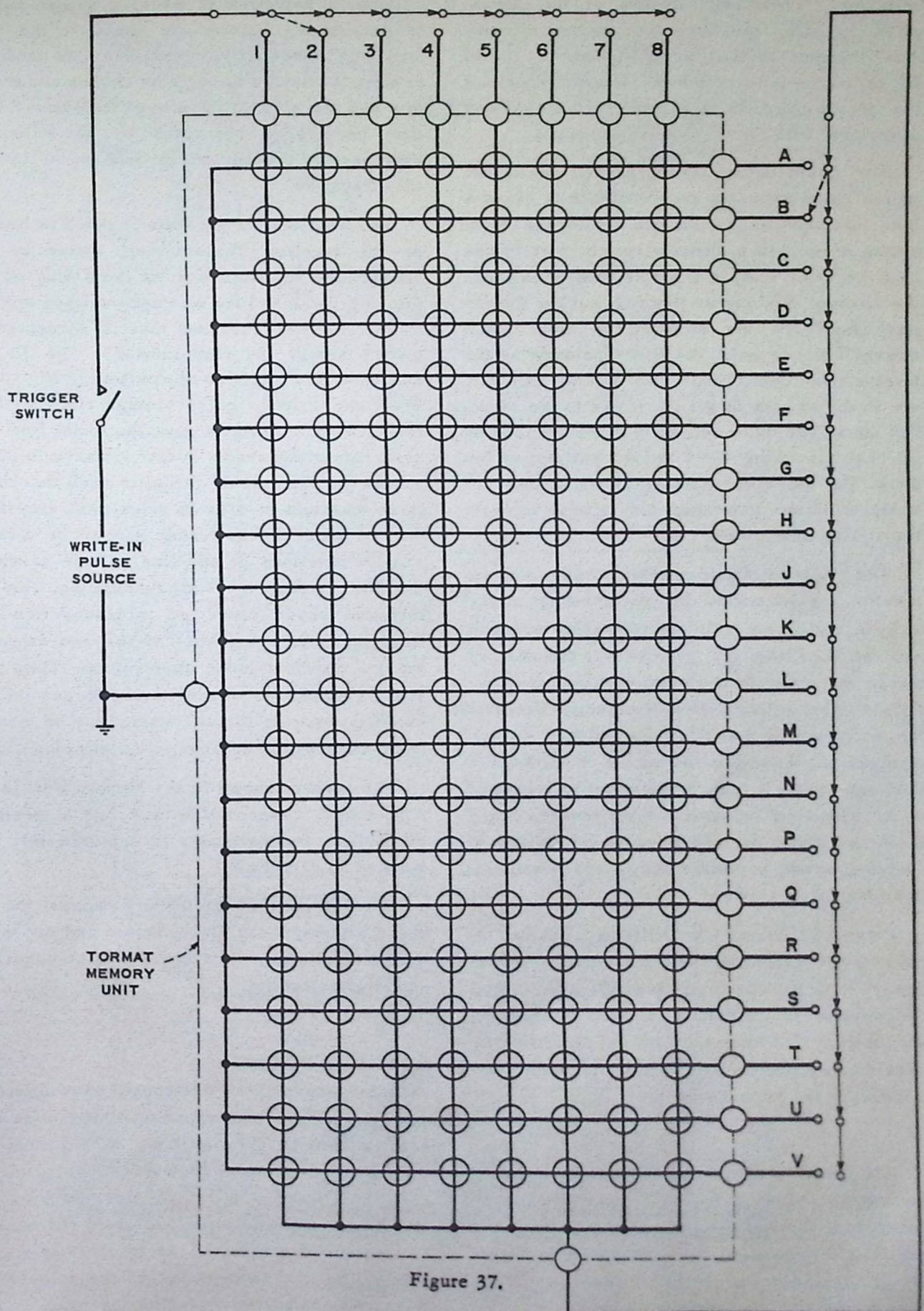


Figure 37.

selection "numbering" system of the phonograph by using the letter and number circuits that intersect in that toroid. (Example: toroid B2 is at the intersection of circuits B and 2.) The matrix circuits and switches are shown associated with the write-in pulse source.

Any toroid in the matrix can be set to the select state by using the two write-in circuits that intersect at the chosen toroid and energizing them with a write-in current that is one half the value that, in a single wire, will cause the change. The circuit wires thread the toroids once only and are arranged so their "half-current" fields have the same polarity at the intersection toroid. The two fields, together, are strong enough to set the toroid to the selected state. The other toroids that are threaded by the circuits being used remain unchanged because the half-current fields to which they are subjected have less than the critical strength required to affect them.

The write-in "half-current" value and its duration is controlled by the capacity of the write-in condenser, C1, the voltage to which it and the condenser C2, (*Figure 36*) are charged and by the resistors and other components in the circuit. The polarity of the magnetic fields at the intersection toroid is established by the arrangement of the internal wiring of the Memory Unit and by the circuit arrangement in reference to the Electrical Selector and the remote control steppers. These factors must be recognized in studying circuit operation and in any considerations involving service.

Figure 38 shows the write-in circuits, including the electrical selector and the remote control step switches, and identifies the circuit components in reference to the phonograph assemblies. The Memory Unit is simplified by showing only nine toroids in order to more clearly indicate the circuit sequence.

The write-in current pulse is supplied by the energy stored in the .068 condenser that is connected, through a 270K resistor, across the two OA2 voltage regulator tubes shown in *Figure 36*. The condenser is charged to 300 volts by the drop across the two regulator tubes.

When a selection is made, a trigger switch in the Pricing Unit or the circuit in the Step Switch is momentarily closed. The .068 condenser then discharges through the chokes and resistors and the write-in circuits of the Memory Unit that have been connected by the selection switches in the Electrical Selector or by the Step Switches.

The amplitude of the write-in pulse is limited to the required "half-current" value by the chokes and resistors and by the action of the clipping diode and the reference voltage applied to the 10 mfd condenser that is connected to ground across the OA2 tube V5. The 10 mfd condenser is charged to approximately 147 volts. When the write-in pulse voltage rises to this value, current flows through the diode from the condenser and prevents further increase in pulse amplitude. The circuit design is such that there is no variation in write-in pulse peak amplitude due to transient switching sputter or voltage supply variations at any line voltage at which the OA2 regulator tubes are functioning. The 33K resistors shown connected to ground from the common contact segments of the two steppers are for transient pulse suppression. They prevent accumulation of electrical charges on the external write-in circuit wiring due to normal reverse resistance leakage of the clipping diode.

The resistor shown in the Memory Unit is for temperature compensation and has a positive coefficient. Its resistance is approximately 190 ohms at 85 degrees F.

The 130 and 100 microhenry chokes, the 47-ohm resistors, the 0.01 condenser and the resistor in the Memory Unit are for pulse amplitude and shaping control.

READ-OUT CIRCUIT

It is necessary to interrogate each toroid to determine if its corresponding record side has been selected. This is done with a read-out circuit, the operation of which must be physically correlated with record sides because the mechanism trip operation occurs at the moment of read-out of a selected toroid. This is accomplished by the arrangement of the toroids and their read-out circuit contacts.

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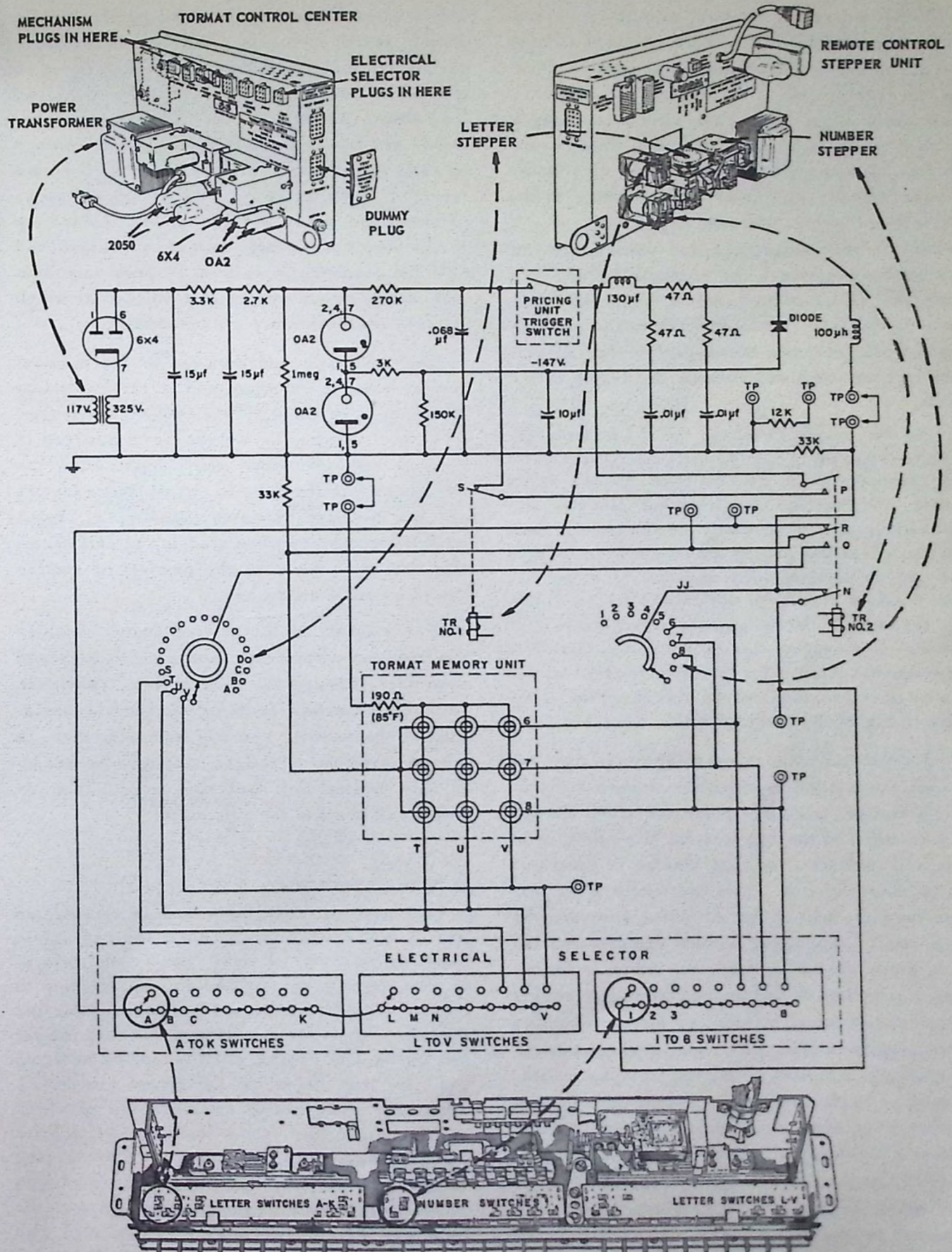


Figure 38. Write-in Circuit.

There are eighty read-out circuits — — one for each record space — — each of which is connected on one end to an individual contact rivet, on the other end to a contact bar which is common to all of them. Each circuit is a single strand or loop of wire threaded through two toroids. The two toroids threaded by these individual circuits are those corresponding to the selections on the left and right sides of the record in the magazine space associated with the read-out contact. The contacts are arranged in a row near the rear edge of the Memory Unit and are spaced, center-to-center, the same as the record spaces in the magazine. The contact bar is continuous and extends the length of the Unit.

As the carriage scans, the contact plunger block *shown in Figure 34* moves with it. One of the plungers is in contact with the bar at all times and another, the read-out plunger, progressively and momentarily connects with each of the contacts. The Memory Unit is positioned on the mechanism so connection is made with the read-out circuit for the toroids corresponding to the record the carriage is approaching as it scans to the right. For example, the circuit is through the toroids for the A5-B5 record as the carriage is passing from the A4-B4 record position to the A5-B5 record position.

While the carriage is scanning to the right and during the interval in which the plunger is touching a contact, a current pulse is passed through the circuit and the two toroids. If a toroid is in the selected state, an output pulse is generated in an output circuit. There are two of these output circuits; one is for the pulse generated by any one of the eighty toroids representing the left sides of the records, the other is for the pulse generated by any one of the eighty toroids representing the right sides of the records. The two circuits, a left and a right, connect through amplifying circuits to control relays, respectively, a Left Side and a Right Side Relay. Either relay when energized by an output pulse pre-sets mechanism control circuits and closes a circuit to the trip solenoid which, when operated while the carriage is scanning, causes the carriage to stop and be detented at the selected record.

The read-out circuit is *shown in Figure 39*.

The read-out current is supplied by closing the detent switch contacts (RO) so the read-out condenser, C13, discharges. The condenser is charged to 300 volts by the drop across the two OA2 tubes. (The OA2 tubes, 6X4 rectifier, transformer and filter *shown in Figure 39* are common to both write-in and read-out circuits. They are repeated in the diagrams only for completeness of circuit presentation.) The read-out pulses are independent of supply voltage variations and will be consistently uniform in peak amplitude and shape at any supply line voltage at which the OA2 regulator tubes are functioning.

The amplitude and duration of the read-out current pulse is important and is established by the capacity of the 0.15 mfd read-out condenser, C13, the voltage to which the condenser is charged and the other parts constituting the circuit. As with the write-in circuit, these factors and the direction of current flow in the circuit must be recognized when studying circuit operation and when there is any problem of service due to abnormal conditions.

The segment on the service switch disables the read-out circuit by shorting the 0.15 mfd condenser (through the 4.7K resistor) when the mechanism carriage is being scanned by operation of the switch. The trip solenoid, then, is not operated by selections that may be set up in the Memory Unit and any selected toroids will not be reset to the zero state.

SENSING CIRCUITS

The sensing circuit function is to energize one or both control relays while the carriage is scanning from left to right. The control relays, in turn, operate the mechanism trip solenoid to initiate record transfer and playing, disable the read-out circuit for a brief interval, and pre-set the mechanism control circuits so the selected side (or both sides) of the record are played. There are two sensing circuits each of which has an output loop in the Memory Unit, a filter network, a pulse amplifier, a type 2050 tube and a control relay. One circuit is associated with only the left sides of records and operates the Left Side Relay. The other is associated with only the right sides and operates the Right Side Relay. The circuits, to the outputs of the pulse amplifiers, are *shown in Figure 40* and from the

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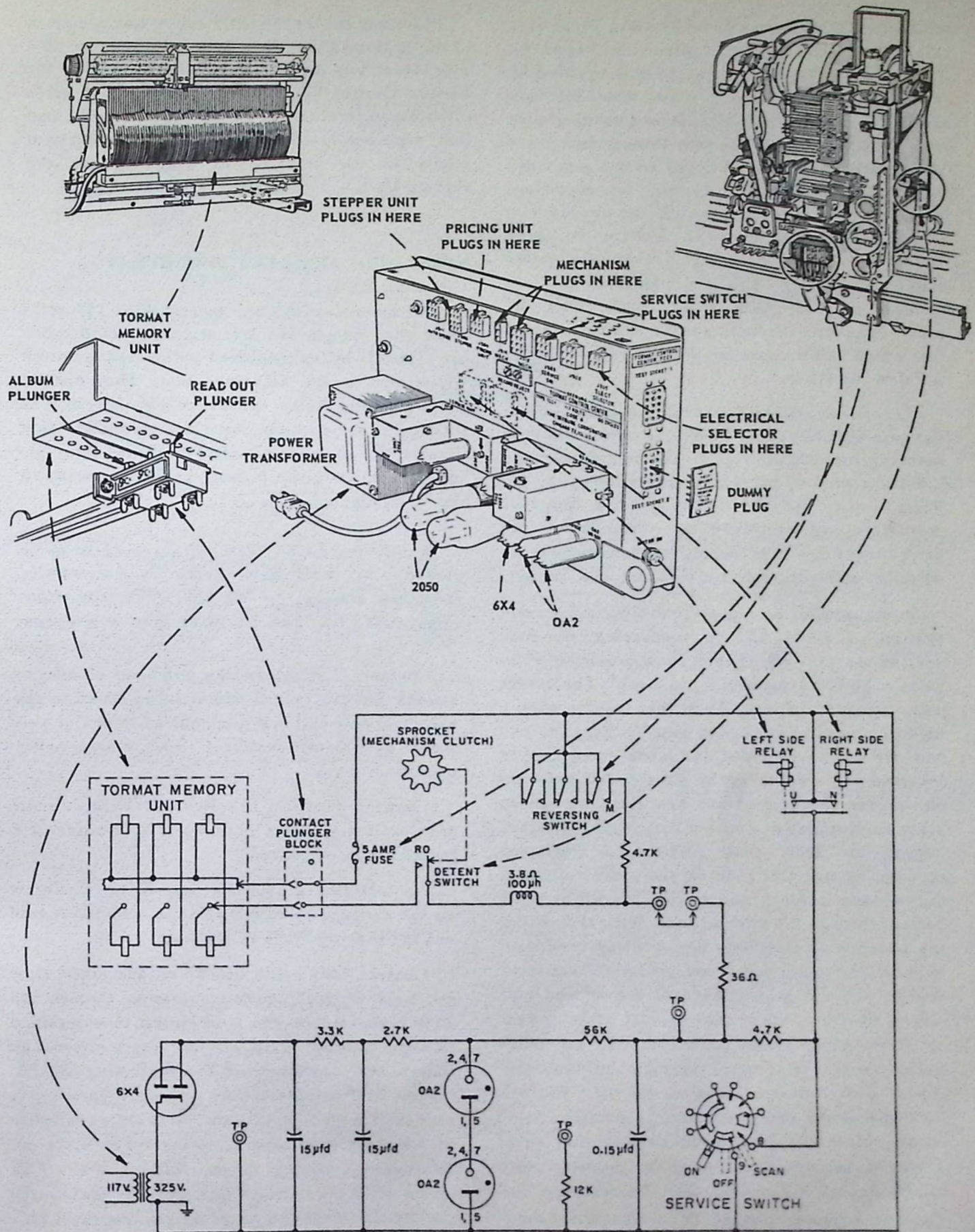


Figure 39. Read-out Circuit.

pulse amplifiers to the Left Side and Right Side relays and their associated circuits in *Figure 41*. The diagram, *Figure 40*, has been simplified by representing the Memory Unit with only six toroids and with the output loops threading once only through them. In the true Memory Unit there are eighty toroids for the left record sides and eighty for the right sides and the loops are threaded three times through all the toroids with which they are associated. The output loops connect to their respective filter and pulse amplifier through shielded conductors. Connection is made with plugs. Each filter and pulse amplifier is contained in a plug-in metal box which, as a complete unit, is referred to as a Pulse Amplifier.

The filter associated with the pulse amplifier prevents relay and switching transients from reaching the amplifier grid. The transformer has a voltage step-up ratio of approximately 1 to 15. Plate supply for the 12AX7 is from the 6X4 rectifier at approximately 200 volts. This is the same rectifier-power supply that furnishes the write-in and read-out currents for the toroids.

In the normal, no-signal condition, the second section of the 12AX7 is conducting, the first section is cut off. There is approximately 14 volts negative bias on the pin-2 grid. The output pulse (from the Memory Unit) that results when a selected toroid is reset to zero is negative and has a duration of about one micro-second. It is inverted and stepped up by the pulse transformer and drives the grid of the first tube section so plate current flows. As soon as the grid is driven enough to start plate current, a switching process occurs that cuts off the plate current of the second section and causes zero-bias plate current through the first section. When the switching process is finished, the coupling condenser between the plate pin 1 and grid pin 7 starts to charge and the grid voltage of the second tube moves toward a value that permits plate current to flow. When plate current starts, the tubes again switch and return to their original condition with the first section cut off. The off-on cycle of the tubes results in a positive pulse at the plate of the second section that is of approximately 80 milli-seconds duration with amplitude of 60 volts. The "stretching" of the one micro-second pulse to 80 milli-seconds is necessary to assure firing the 2050 thyratron during three or more cycles of the alternating voltage of the control relay circuit.

Plate current for the 2050 tubes and operation of the Right and Left Side Relays is from the 155-volt secondary of the main transformer for the Tormat Control Center. Bias for the 2050 grids is obtained from the selenium rectifier and filter that supplies low-voltage d.c. for operation of relays in the step switch assembly and the Pricing Unit.

RIGHT SIDE AND LEFT SIDE RELAYS

(Control Relays)

The control relays are energized at 155 volts when their respective left and right 2050 tubes are "fired" by an amplified pulse from a toroid which was in the selected state. They control the Reversing Relay and hence the direction of rotation of the carriage motor and turntable, they disable the read-out circuit for a brief interval, and they initiate the playing cycle by operating the Trip Solenoid.

If only the LEFT SIDE of a record is to be played, the Left Side Relay is momentarily energized through the left side 2050 tube. Contacts, LST, LSH and U close; contact T opens.

Contact U disables the read-out circuit so toroids for the record which is adjacent to the selected one will not read-out in event of carriage over-travel resulting from sluggish trip operation.

Contact T opens the Reverse Relay circuit and has significance only when both sides of a record are to be played.

Contact LST closes the Trip Solenoid circuit so the carriage is stopped at the selected record and the playing cycle is initiated.

Contact LSH holds the Relay energized after its brief 80 milli-second operation through the 2050 plate circuit. The hold circuit is maintained through contact LSR of the mechanism Cam Switch and contact L of the Reversing Switch. (This latter is closed only when the carriage is scanning from left to right to avoid possibility of transient operation of either relay when the carriage is moving to the left.) Contact LSR opens after the carriage has partially transferred the record to playing position causing the Relay to drop out. The remainder of the playing cycle, including full return of the record to the magazine, is not dependent on the Relay operation.

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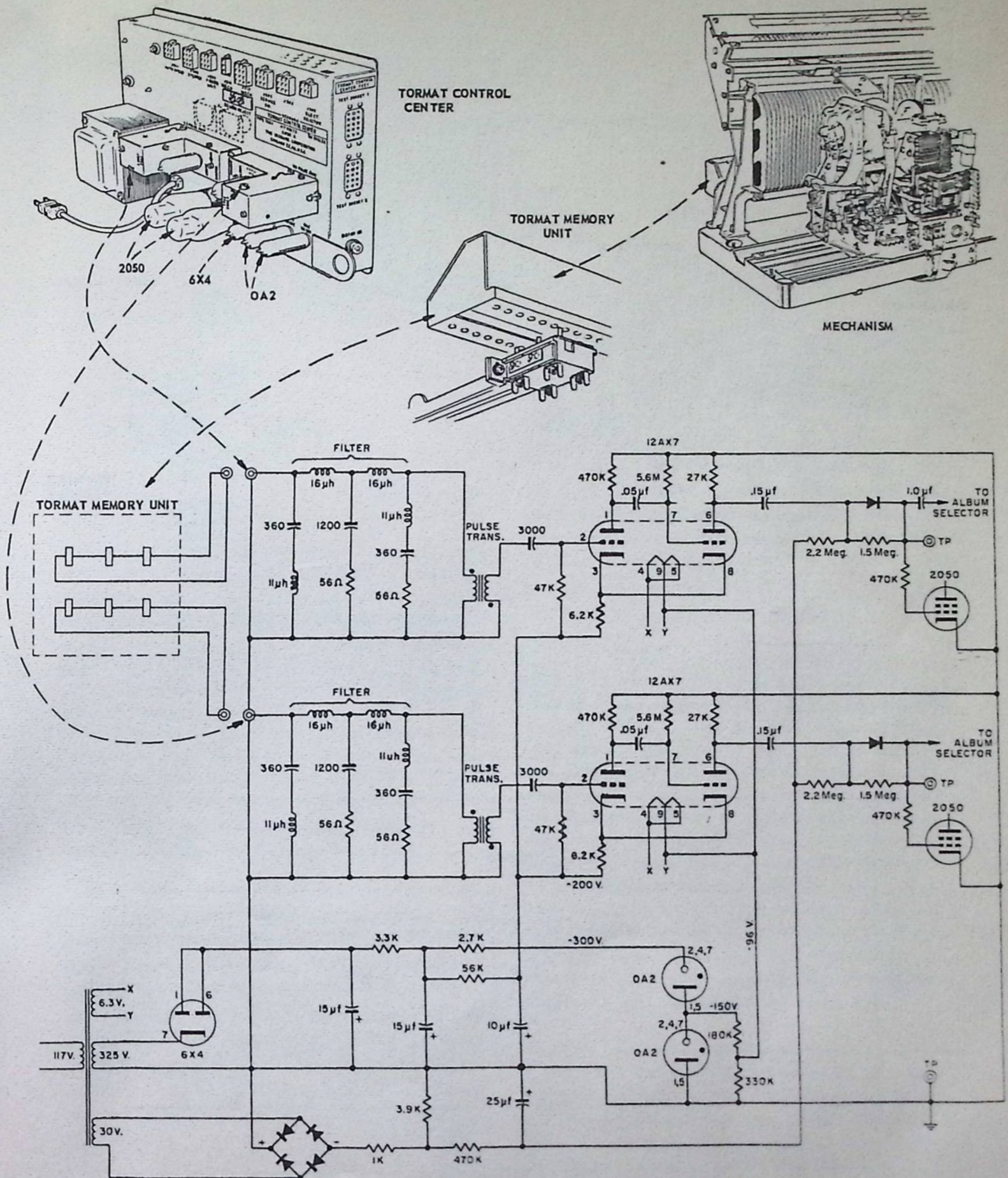


Figure 40. Sensing Circuits.

SELECT-O-MATIC "160" MECHANISM

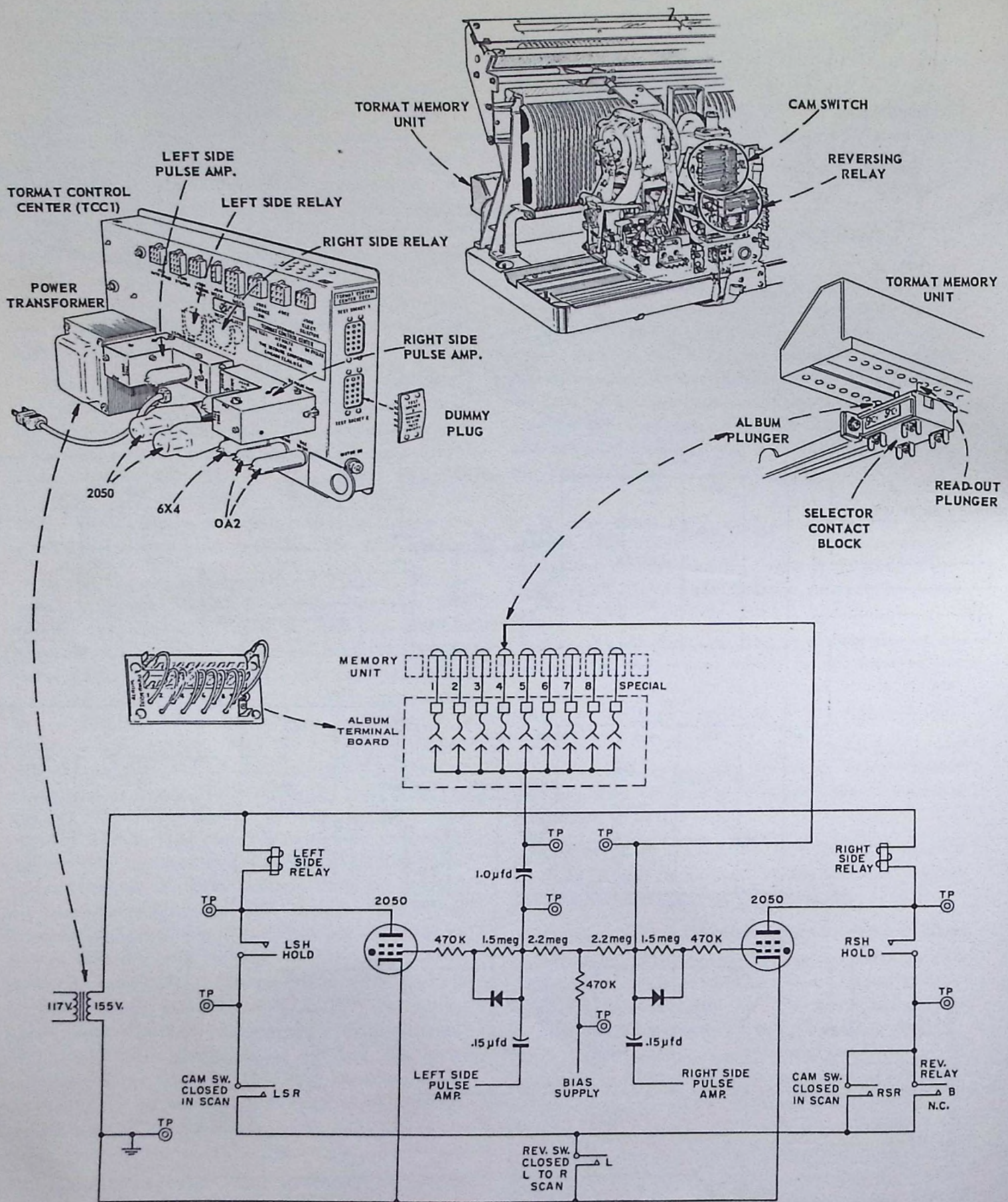


Figure 41. Control Relay Circuits.

SELECT-O-MATIC "160" MECHANISM

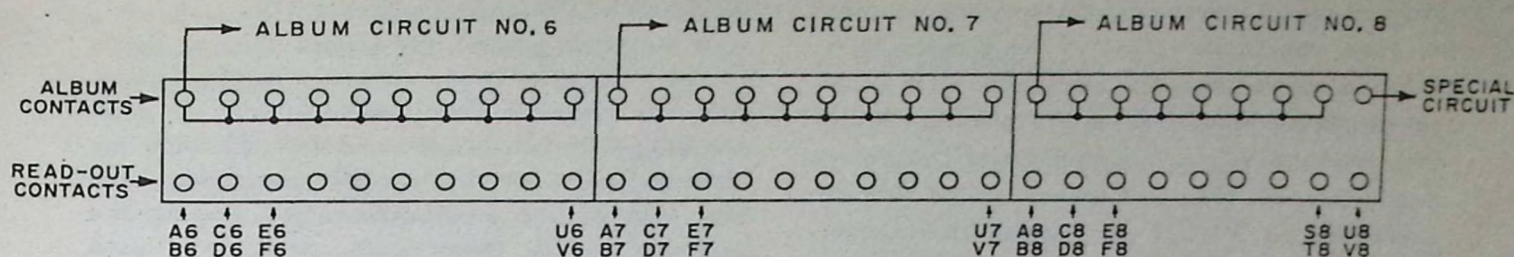


Figure 42.

If only the RIGHT SIDE of a record is to be played, the Right Side Relay is momentarily energized through the right side 2050 tube. Contacts N, D, RST and RSH close.

Contact N disables the read-out circuit. It is in parallel with contact U on the Left Side Relay and serves the same purpose.

Contact D energizes the Reversing Relay so the motor and turntable reverse direction for a right side playing cycle. The circuit is through RR (Cam Switch) and T (Left Side Relay).

Contact RSH holds the relay energized after its brief 80 milli-second operation through the 2050 tube. The circuit is through RSH, contact L on the Reversing Switch and through the parallel combination of contact B on the Reversing Relay, and contact RSR on the Cam Switch. Contact B will open when the Reversing Relay is energized through contact D. RSR will open to drop out the Right Side Relay after the carriage has partially transferred the record to playing position. The Reversing Relay WILL REMAIN IN THE ENERGIZED POSITION BECAUSE OF MECHANICAL LATCHING and the remainder of the playing cycle is not dependent on the Right Side Relay.

If BOTH SIDES of a record are to be played, BOTH Relays are momentarily energized and lock up through their holding circuits. With contact T (L.S. Relay) open, the Reversing Relay will not be energized so the motor direction is unchanged and the left side of the record will be played. The Left Side Relay will drop out when contact LSR opens during the early part of the record transfer but the Right Side Relay will remain energized through contact B on the Reversing Relay.

On completion of left side playing, the record transfer operation (to the magazine) will begin

and will continue until the Reversing Relay is energized by the closing of Cam Switch contacts RR. The circuit is to the Reversing Relay through contact T (Left Side Relay), contact D (Right Side Relay - still energized) and RR. This occurs in the transfer operation from left side play at about the time the record is fully into the magazine. It results in motor and turntable reversal and initiation of a right side playing cycle. Contact RSR on the Cam Switch will open to drop out the Right Side Relay after the record transfer has been partially completed but the Reversing Relay will remain in the energized position due to mechanical latching until the playing cycle has been completed.

ALBUM PLAY

Album Play is accomplished by coupling the two 2050 tubes so both the Left Side and Right Side Relay are energized when read-out occurs of either a left or right side selection. The subsequent playing is the left-right sequence had when both sides of a Single Play record have been selected. The 2050 tubes are coupled by connecting together their control grids through a condenser and a circuit which includes Album Contacts on a Tormat Memory Unit, a contact plunger in the Memory Unit contact plunger block, and an Album Terminal Board. The circuit is shown in Figure 41; the Memory Unit Album Contacts are identified in Figure 34.

There are eighty Album Contacts arranged in a row near the front of the Memory Unit. They are directly opposite the read-out contacts and are spaced, center-to-center, the same as the magazine record spaces so there is one for each record just as there is a read-out contact for each record. The album contacts are connected in seven groups or blocks of ten each, in one

group of nine contacts and there is one contact, the last one at the right of the Memory Unit, which is not connected to any group. Each of the seven groups of ten contacts is associated with the ten records in a "Number Group" of selections, e.g., the ten contacts associated with the selections A1, B1, C1, etc., are an interconnected group; A2, B2, C2, etc., are another interconnected group. This is shown in Figure 42 in which the No. 6, 7 and 8 groups are diagrammed. The diagram, Figure 41, has been simplified by showing each of the eight groups as a single contact.

The nine Album Circuits in the Memory Unit are extended through a cable and 9-contact plug to the Album Terminal Board and terminate there with flexible leads having push-on contacts. The leads can be connected to either a retaining strip which has no connection or to the Album terminal strip which connects through a 1 mfd condenser to the grid of the Left Side 2050 tube.

The Album plunger in the contact plunger block connects to the grid of the Right Side 2050 tube and is touching the Memory Unit Album Contact for a record at the time the read-out plunger is touching the Read-out Contact for the same record. If the Album Circuit is complete through the Terminal Board, both 2050 tubes will be "fired" by a pulse from either pulse amplifier. Any or all Number Groups of records can be set up for Album Play or Single Play by choice of lead connections at the Album Terminal Board. It should be recognized, however, that an entire group will be either Album Play or Single Play; the mode of play, except for record U8-V8, cannot be intermixed within a Number Group. The "Special" Album Contact in the No. 8 Group and its flexible lead at the Terminal Board are associated with the U8-V8 record position so that record has independent Album or Single Play control or selection V8 can be associated with a control circuit for other service.

TEST POINTS

The test points, indicated by "TP" in the diagrams provide convenient access to the circuits for voltage or continuity tests but have no function in normal operation. It will be noted, however, that the read-out and write-in circuits (Figures 38 and 39) each have a pair of connected test points. These connections are made with a "dummy plug" which must be plugged-in for normal phonograph operation.

SUMMARY - OPERATION SEQUENCE

A complete control and record playing cycle of the Select-O-Matic mechanism begins when, with the carriage at stand-by, ready to start scanning, a record is selected. It ends when the carriage scans to the standby position at the left side of the mechanism after playing the selected record. Between the start and finish there is a fixed pattern of operation that is given below. If this pattern or sequence is coupled with the operating information of the preceding pages, it will be helpful in mechanism study and a valuable aid in determining cause for possible abnormal operation. A sequence is given for playing only the left side of a record, for playing only the right side and for operation when both sides are to be played.

LEFT SIDE PLAYING

1. Selection is made by pressing a letter and a number key at the Electrical Selector.
2. Number key: (a) closes $\frac{1}{2}$ -current write-in circuit through all toroids in selected "number" group; (b) closes "number" Start Switch.
3. Letter key: (a) closes $\frac{1}{2}$ -current write-in circuit through all toroids in selected "letter" group; (b) closes "letter" Start Switch.
4. Cancel solenoid in Pricing Unit is momentarily energized by closing the second Start Switch.
 - (a) A credit is cancelled.
 - (b) The Play Control Add Solenoid is momentarily energized.
 - (c) Write-in trigger switch momentarily closed to complete the write-in circuit so the .068 mfd write-in condenser is discharged through the circuits coincident through the selected toroid.
5. Play Control Add Solenoid closes Play Control Switch.
6. Mechanism motor turns on.
7. Carriage scans to the left approximately three inches.
8. Reversing switch actuating lever is moved to the right.
9. Reversing relay de-energized.
10. Mechanism motor reverses so turntable is turning clockwise and carriage scans to right.

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11. Read-out current pulse resets toroid of selected record and causes firing of Left Side 2050 tube.
 12. Left Side Relay energized and is held energized through its hold contact (LSH), Cam Switch (LSR), and Reversing Switch (L).
 13. Trip solenoid energized through trip contact (LST), Clutch Switch (W), and Reversing Switch (E).
 14. (a) Clutch shifted from engagement with sprocket.
(b) Sprocket engaged by detent roller.
(c) Carriage scanning ceases.
 15. Upward movement of clutch (shifting lever) opens Clutch Switch contact W to break circuit of trip solenoid.
 16. Reset Lever Switch, contacts IC, open.
 17. Clutch engages clutch worm.
 18. Cam assembly rotates from scan position.
 19. Pickup arm starts toward left side play position (if not there).
 20. Cam Switch contacts, LSR, open to de-energize Left Side Relay.
 21. Safety trip plunger moves to play position.
 22. Clutch is locked in transfer position by clutch cam and clutch shifting lever roller.
 23. Transfer arm and record start upward movement.
 24. Reset of trip mechanism commences.
 25. IC contacts close.
 26. (a) Reset of trip mechanism completed.
(b) Detent locked by force applied by detent lever.
 27. Transfer arm completes travel to play position.
 28. Clamp arm centers and clamps record.
 29. Transfer arm head moves away from record.
 30. Pickup stylus placed on record.
 31. MB contacts open.
 32. Mute relay (in amplifier) de-energized.
 33. Cam Switch V contacts close.
 34. Cam Switch C contacts close.
 35. Popularity meter energized through C, SC and IC.
 36. SC contacts open, de-energizing popularity meter.
 37. Cam Switch O contacts open circuit to 1.65 mfd motor capacitor.
 38. Pickup arm is released.
 39. (a) Clutch disengages from clutch worm and moves to play position.
(b) Sprocket detent force from clutch shifting lever is released.
(c) Cam rotation ceases.
- RECORD IS NOW PLAYING — —
40. Pickup follows record grooves to trip-off.
 41. Trip Switch closes.
 42. Mute Relay energized through the Trip Switch.
 43. Trip solenoid energized through MT contacts of Mute Relay.
 44. (a) Clutch shifts upward from play position.
(b) Sprocket detent force applied by clutch shifting lever.
(c) IC contacts in reset lever switch open.
 45. Clutch engages clutch worm.
 46. Cam assembly rotates from play position.
 47. Cam Switch O contacts close so motor operates with maximum torque.
 48. V contacts open.
 49. Cam Switch contacts MB close.
 50. Clutch is locked in transfer position by clutch cam and clutch shifting lever roller.

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51. Pickup is lifted from record.
52. Reset of trip mechanism commences.
53. Reset Lever Switch contacts IC close.
54. Pickup arm resets to scan position.
55. Trip switch resets to open position.
56. Transfer arm moves toward record.
57. Clamp arm releases record.
58. Reset of trip mechanism completed.
59. Transfer arm and record start downward travel.
60. Detent lock by detent lever is relieved.
61. Safety plunger moves to scan position.
62. Transfer arm completes travel to scan position.
63. Clutch shifting lever roller moves down into scan notch of clutch cam.
64. Clutch moves down from transfer position.
65. (a) Clutch engages sprocket.
(b) Sprocket detent released.
(c) Cam rotation ceases.
66. Carriage scans until the play control subtract solenoid has been operated twice.
67. Play control switch opens and turns off motor.
68. Carriage stops, in scan position, at left side of mechanism with reversing switch in position for scanning to the left, with reversing relay energized through reversing switch contact F and with mute relay energized through cam switch contact MB.

RIGHT SIDE PLAYING

The following is the operation sequence in which the right side of a record is played. The sequence steps, 1 through 11, given for left side play are the same and are not repeated. The sequence here begins with the Right Side Relay being energized and ends with the carriage again at rest.

1. Right Side Relay energized and is held energized through its hold contacts (RSH), Cam Switch (RSR) and Reversing Switch (L).
2. (a) Trip solenoid energized through trip contact RST, Clutch Switch (W) and Reversing Switch (E).
(b) Reverse Relay energized through Right

Side Relay contact D, Left Side Relay (T) and Cam Switch (RR).

3. Reverse Relay changes motor direction.
4. Trip solenoid operation results in:
 - (a) Clutch shifted from engagement with sprocket.
 - (b) Sprocket engaged by detent roller.
 - (c) Carriage scanning ceases.
 - (d) Clutch Engaging Member shifts to left-side-play position.
5. Upward movement of clutch (shifting lever):
 - (a) Opens Clutch Switch contact W and circuit of trip solenoid.
 - (b) Reverse Relay Latch Lever engages relay latch bar.
6. Reset Lever Switch, contacts IC open.
7. Clutch engages clutch worm.
8. Cam assembly rotates from scan position.
9. Pickup arm starts toward right side play position (if not there).
10. Cam Switch Contacts, RSR, open to de-energize Right Side Relay.
11. Right Side Relay contacts D open to de-energize Reverse Relay but relay is held, mechanically, in energized position by Reverse Relay Latch Lever.
12. Cam Switch contacts RR open.
13. The ensuing operation of Right Side Play is the same as given for Left Side Play from 21 through 64 in which transfer to play position and playing is completed and the record is again in the magazine. Following step 64 (of Left Side Playing) the downward movement of the clutch is only as far as its intermediate position in which it is not engaged with the sprocket but is held from engagement by the clutch engaging member.
14. The motor changes direction (to clockwise turntable rotation).
15. The clutch shaft changes rotation direction and the clutch engaging member shifts position to permit the clutch to engage the sprocket.
16. (a) Clutch engages sprocket.
(b) Sprocket detent is released.

17. The carriage scans and, after two operations of the play control subtract solenoid, it stops at its rest position.

LEFT AND RIGHT SIDE PLAYING

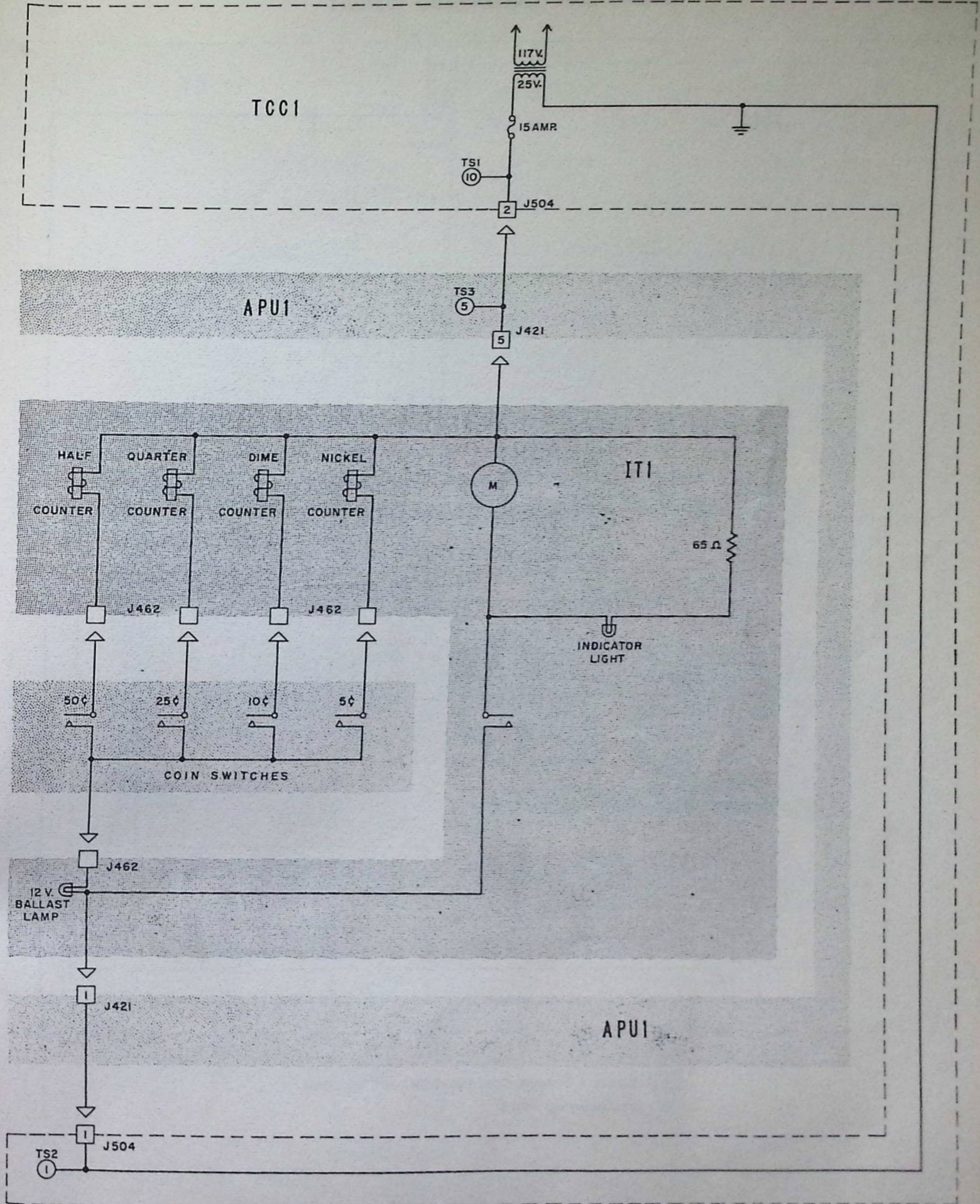
In the following sequence, the steps 1 through 11, given for left side play are the same and are not repeated. The sequence here, begins with both the Left Side Relay and the Right Side Relay being energized and held energized through their respective hold circuits as outlined in the previous sequences.

1. Trip solenoid energized through parallel trip contacts RST (LST), Clutch Switch (W) and Reversing Switch (E).
2. Reverse Relay is NOT energized because circuit is open at Left Side Relay contact T.
3. Ensuing operation follows that of Left Side Play (only) from steps 14 through 62, except

that the Right Side Relay will remain energized through its hold circuit, contacts RSH, Reverse Relay (B) and Reversing Switch (L). Concluding step 62 (of Left Side Playing) the mechanism is in a position in which the cam assembly will require only a few degrees more rotation before the clutch shifting lever roller could move into the scan notch of the clutch cam so the clutch is still engaged with the clutch worm. At this point the sequence for Left and Right playing resumes as follows:

4. Cam Switch contact RR closes.
5. Reverse Relay energized through RR, D and T (as in 2b of Right Side Playing).
6. Motor direction changes to counter-clockwise turntable rotation (for right side playing).
7. Completion of the both-sides sequence is the same as given for Right Side playing, steps 8 through 17.

INCOME TOTALIZER COUNTER CIRCUIT

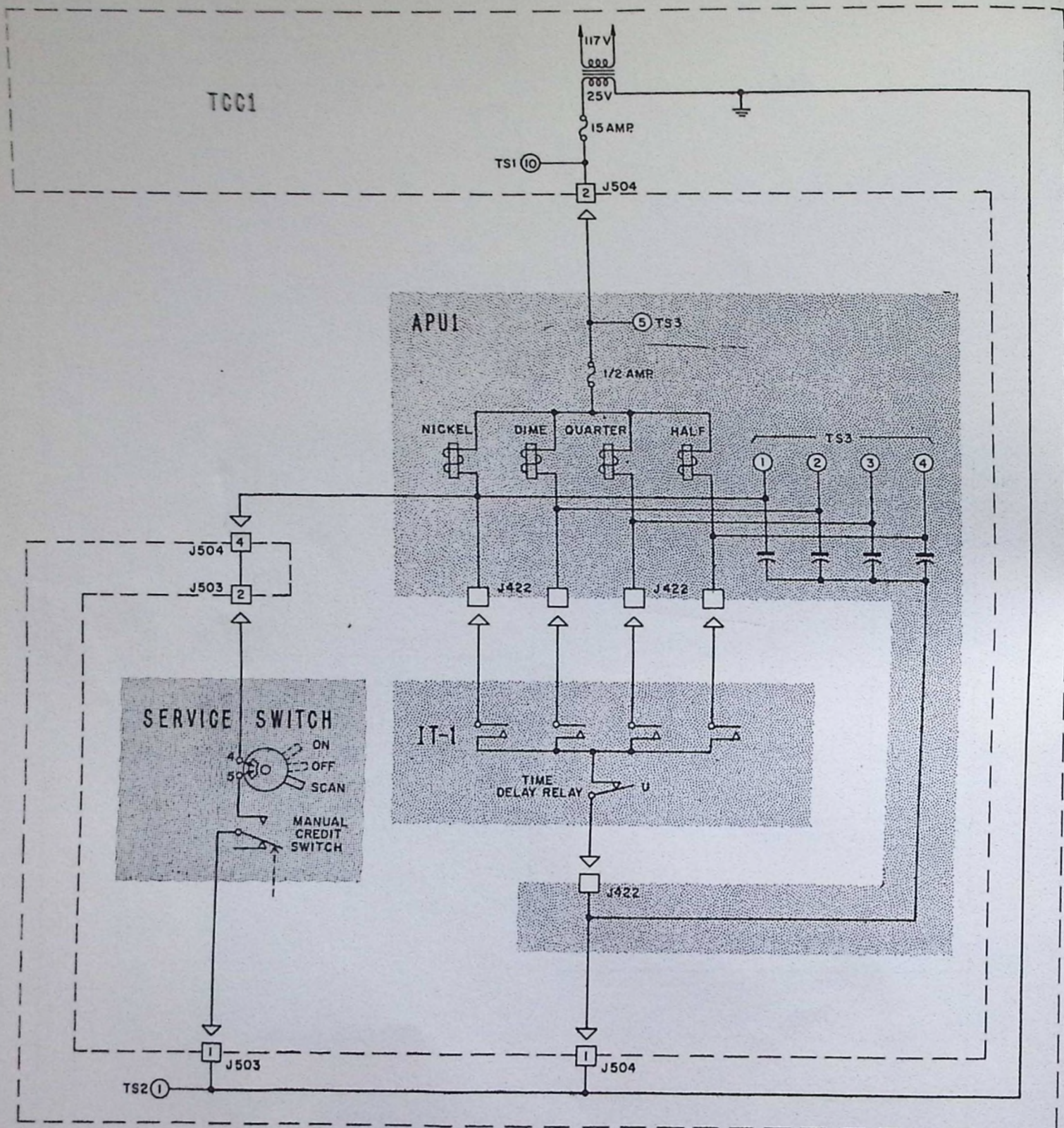


CHASSIS CONNECTOR AND CONTACT NUMBER.



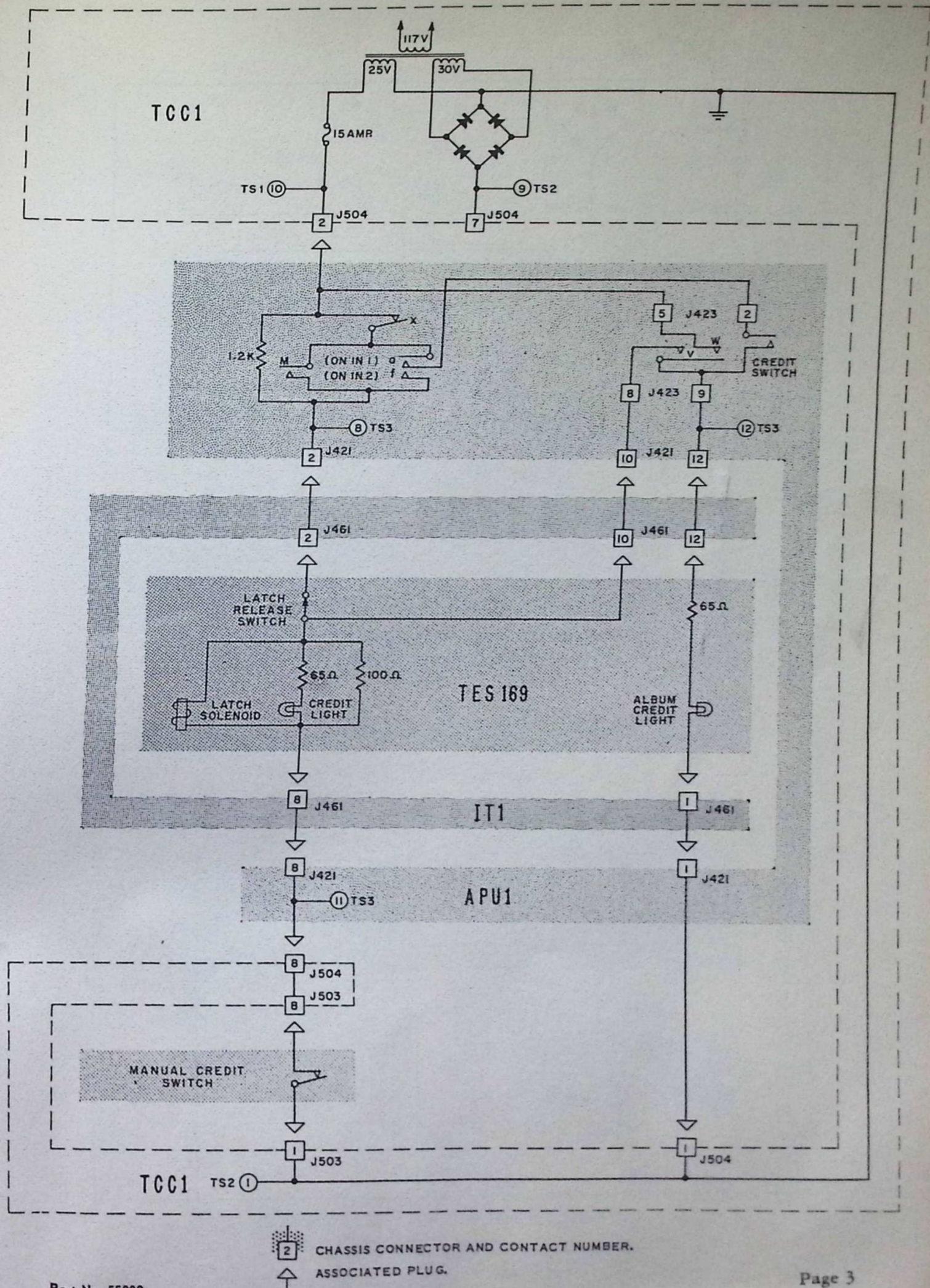
ASSOCIATED PLUG.

PRICING UNIT CREDIT ADD CIRCUIT

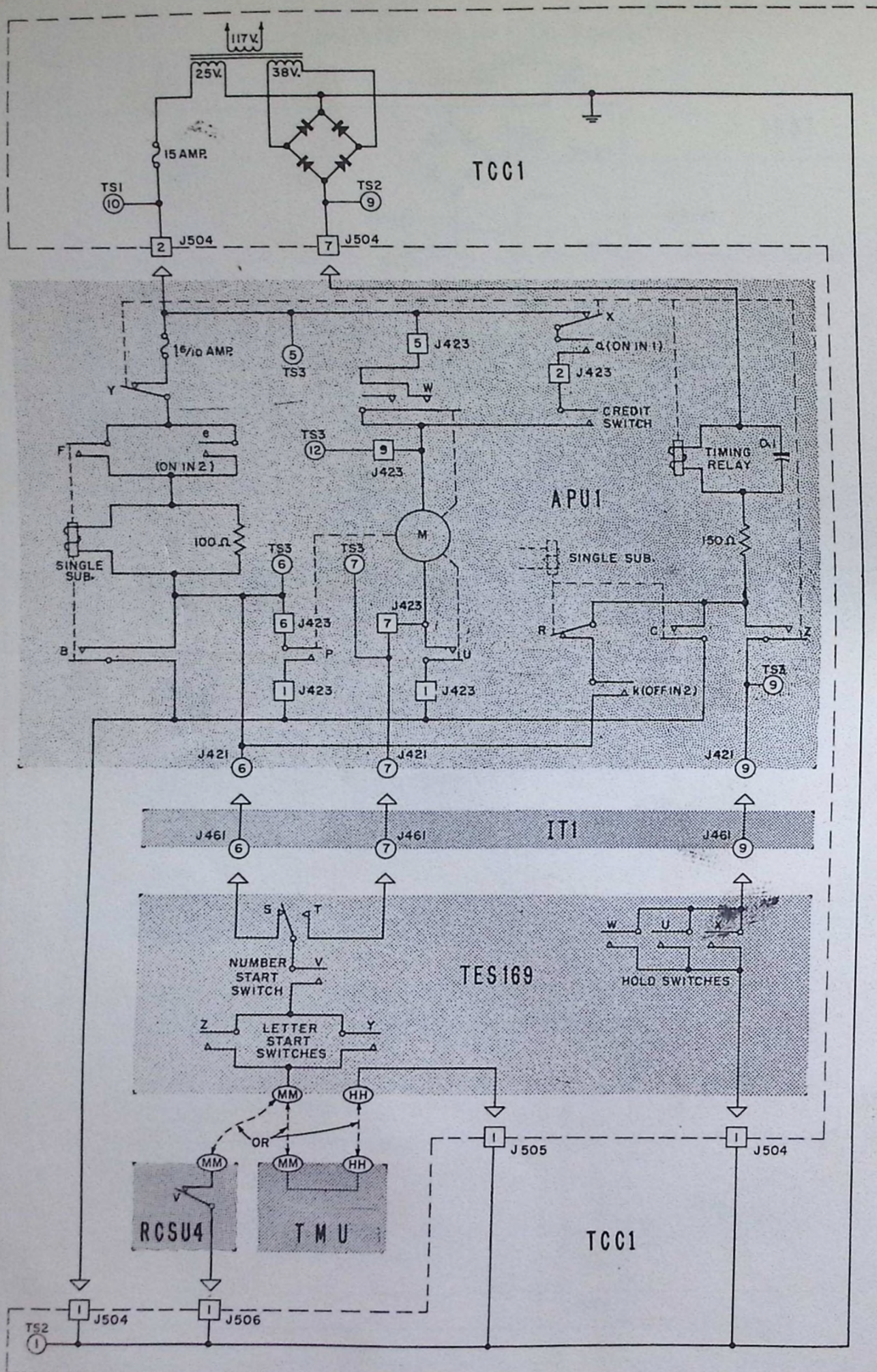


 CHASSIS CONNECTOR AND CONTACT NUMBER.
 ASSOCIATED PLUG.

LATCH SOLENOID AND CREDIT CIRCUIT

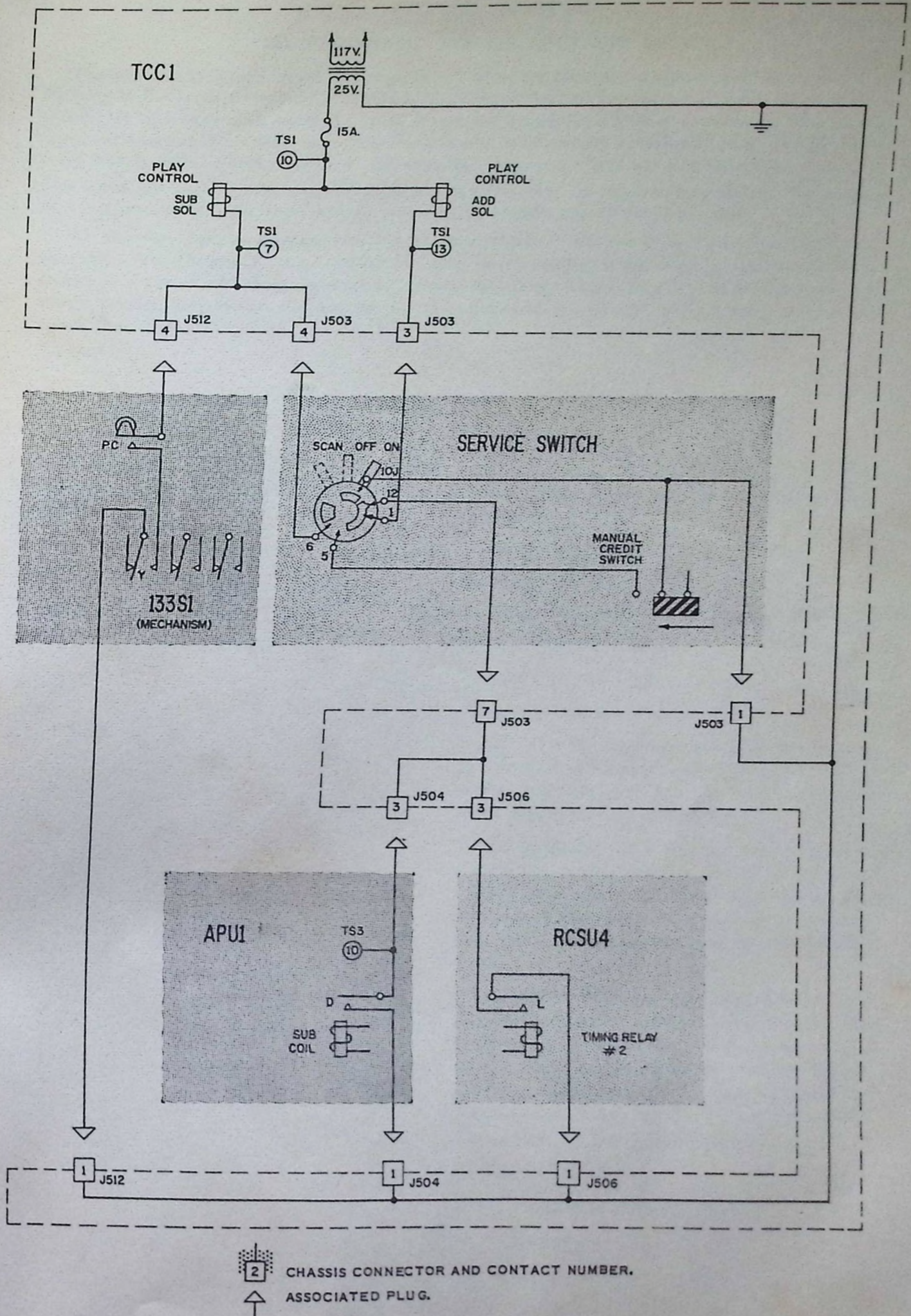


CREDIT SUBTRACT CIRCUIT



CHASSIS CONNECTOR AND CONTACT NUMBER.
 ASSOCIATED PLUG.

SCAN CONTROL CIRCUIT



PICTURE DIAGRAMS

SELECT-O-MATIC MODELS LPC1 AND LPC1R

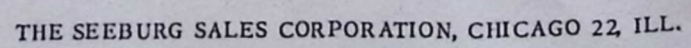
The picture diagrams on the next four pages show the control and operational "circuits" of the Seeburg L.P. Console, Model LPC1 and LPC1R. Each diagram concerns one or two major elements which, if not operating normally, will result in abnormal equipment performance that is very apparent and can be readily observed. These major elements are identified and are at the end of lines which, if followed, "connect" all switches, fuses, or relays associated with the "circuit". The lines are marked with arrowheads to assist in tracing. The broken lines indicate the location of switches, relays and fuses and are an aid in finding the part in the phonograph.

To use the diagrams, start with the element which is not operating correctly, i.e., Motor, amplifier, Trip Solenoid, etc.. Follow the line to its *starting point* working *against* the black arrows — — never *with* them. By working *against* the arrows, the lines will lead through each item where trouble may occur. If there are lights or fuses in the circuits being traced, observe and check them first.

EXAMPLE:

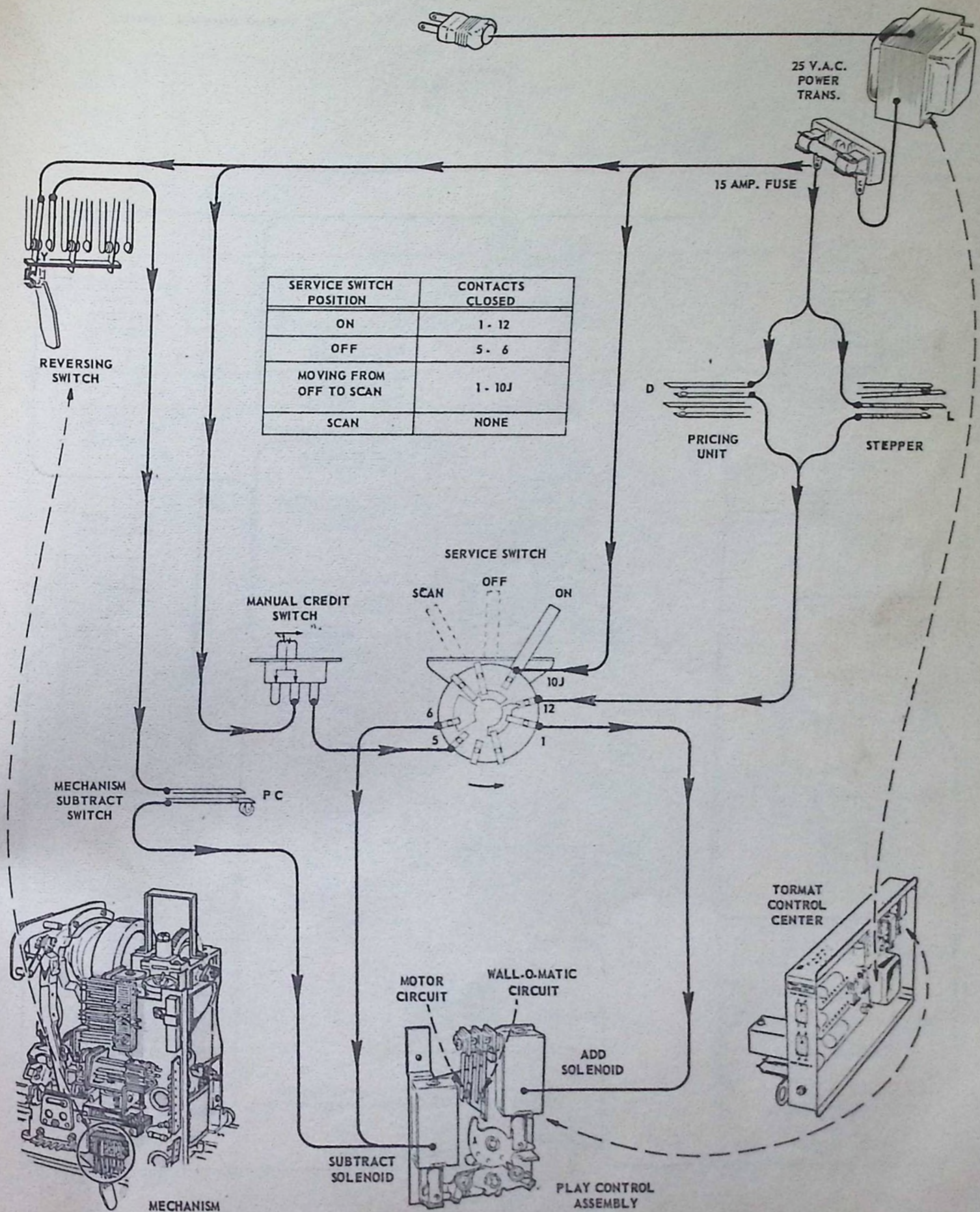
TROUBLE	CHECK
Motor does not run. Use diagram "Motor Control Circuit".	Check from Mechanism Motor against black arrows to: A. Reversing Relay. B. Motor Condenser. C. Power Relay on 45 r.p.m. Auto-Speed Unit. D. Scan Control Switch. E. Line Cord and Plug. F. Main Switch and Main Fuse. If the OA2's have a purple glow, items E and F can be eliminated as possible causes of mechanism motor failure because both motor and power supply operate through them. If the indicator lamp on the Tormat Control Center lights when Service Switch is moved to SCAN position, items D, E and F can be eliminated as possible cause of motor failure because both motor and indicator lamp operate through them. If manual operation of the Play Control Add Solenoid and Scan Control Switch causes the motor to run, check the Add Solenoid to see if it is being energized. If the Add Solenoid is not being energized use "Play Control Assembly" diagram and check the 25 V line against the arrows from the Add Solenoid through: A. Service Switch. B. "D" Contact of Pricing Unit. C. 15 Amp. Fuse.

Select - O - Matic Models LPC1 and LPC1R
(NOT A SCHEMATIC OR WIRING DIAGRAM)

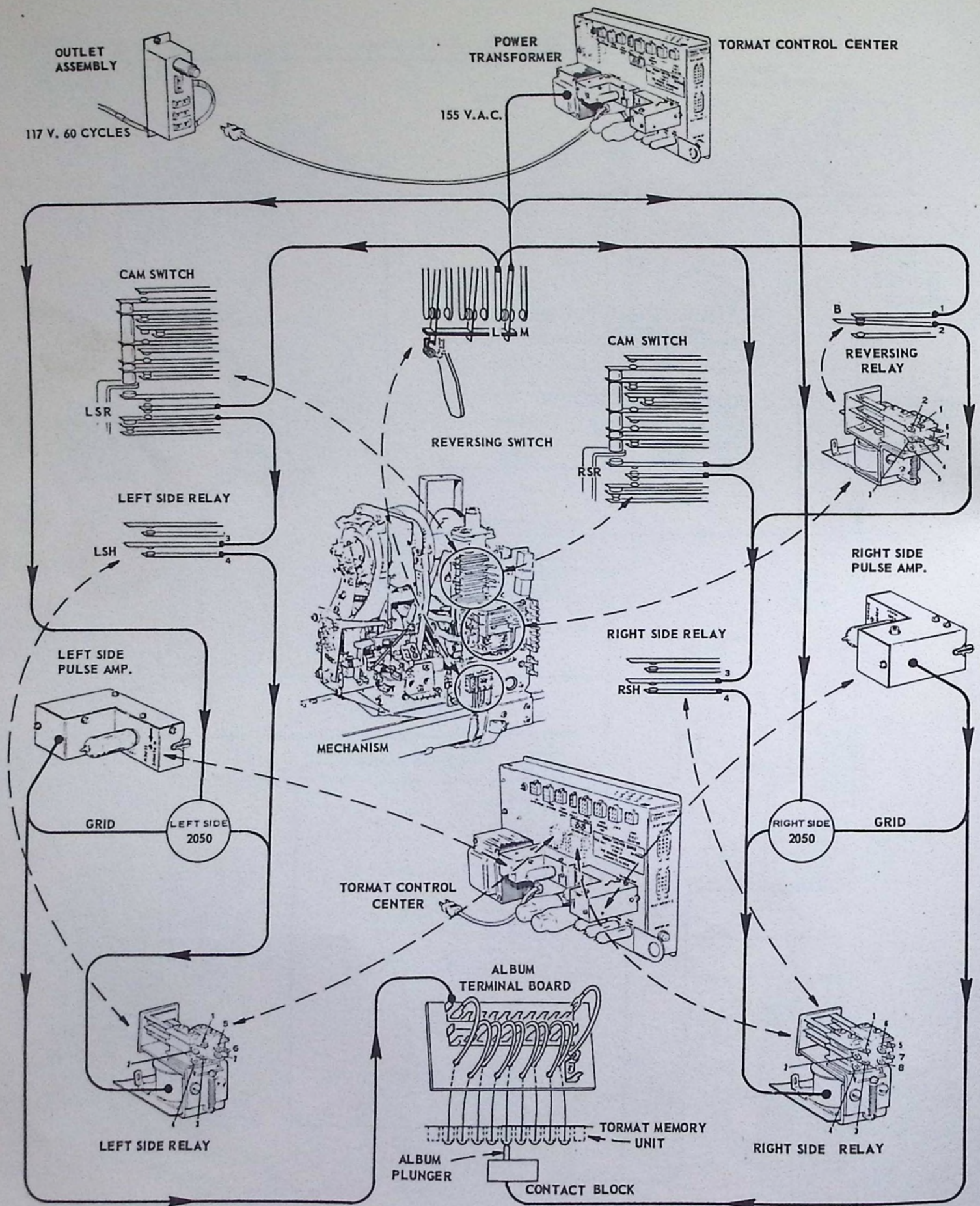


PLAY CONTROL CIRCUIT

Select - O - Matic Models LPC1 and LPC1R
(NOT A SCHEMATIC OR WIRING DIAGRAM)



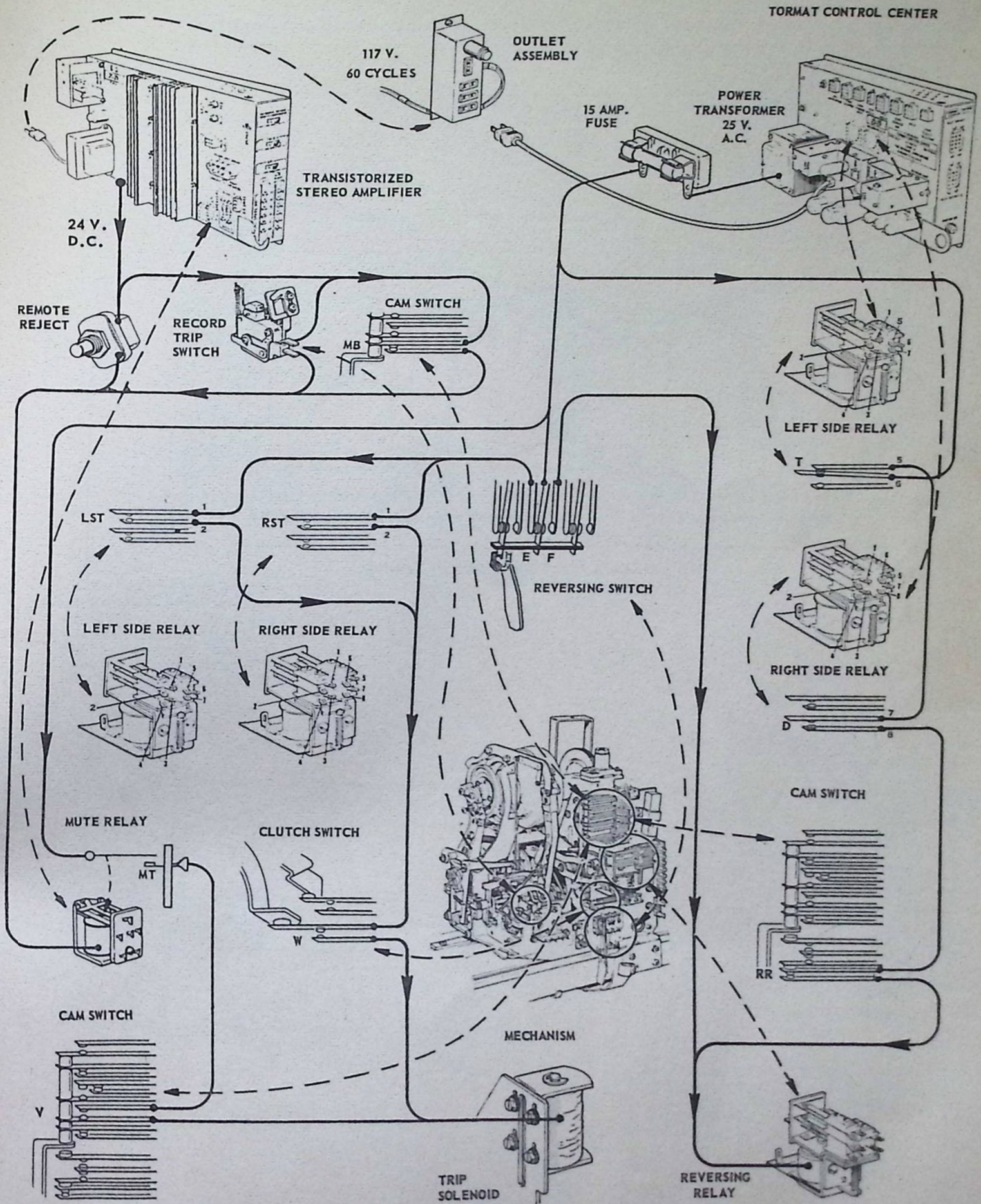
LEFT SIDE - RIGHT SIDE RELAYS
Select - O - Matic Models LPC1 and LPC1R
 (NOT A SCHEMATIC OR WIRING DIAGRAM)



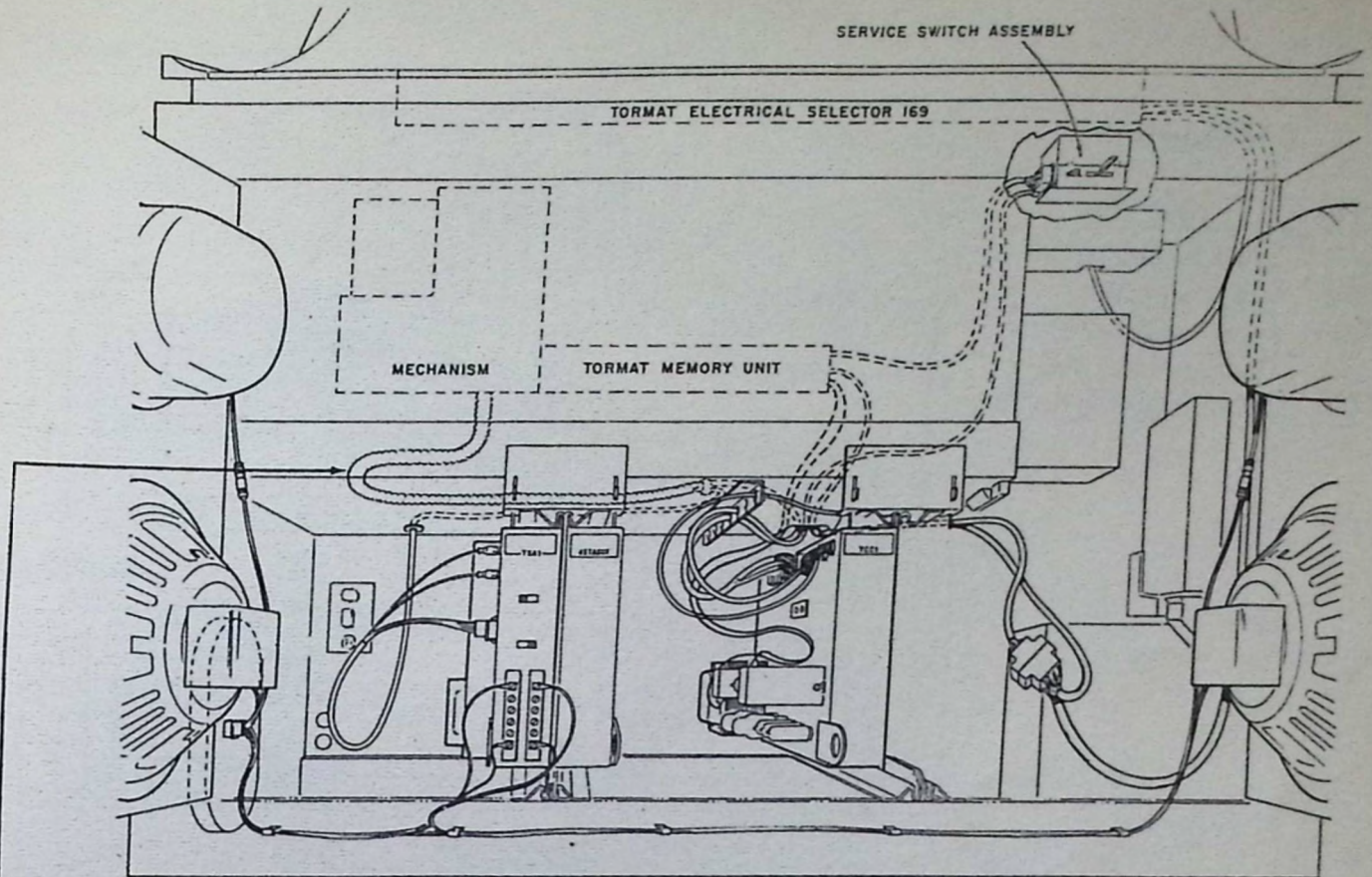
TRIP SOLENOID AND REVERSE RELAY CIRCUIT

Select - O - Matic Models LPC1 and LPC1R

(NOT A SCHEMATIC OR WIRING DIAGRAM)

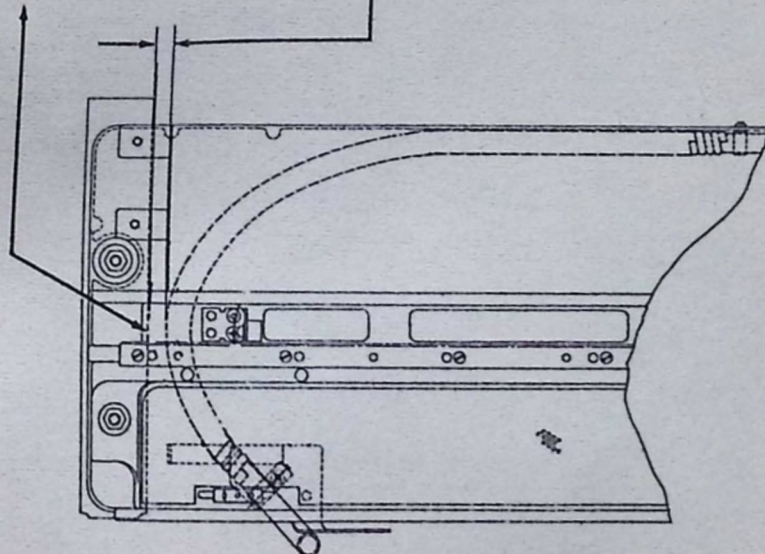


SELECT-O-MATIC MODELS LPC1 and LPC1R

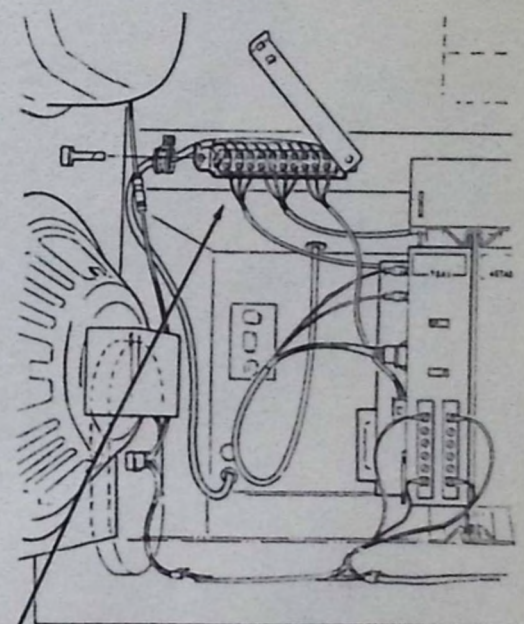


Access to Units and Cable Dressing.

WITH MECHANISM AGAINST CARRIAGE STOP AT LEFT END OF BASE, CABLE MUST BE DRESSED SO THAT LOOP IS FROM JUST TOUCHING TO A MAXIMUM OF $\frac{1}{2}$ INCH FROM SHOCK MOUNTING CHANNEL.



Mechanism Cable Dressing Detail.



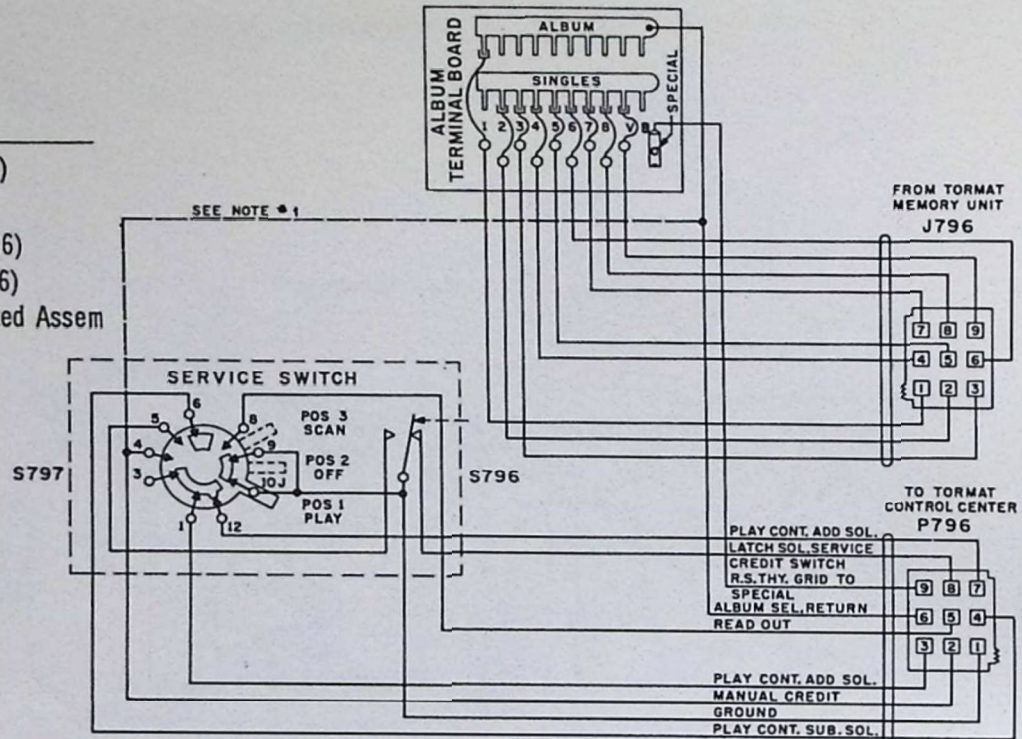
TERMINAL BLOCK FOR CONSOLEETTE CONNECTING IN LPC1R MODEL. SEE CONSOLEETTE MANUAL (PART NO. 507499) FOR CABLE DRESSING.

SELECT-O-MATIC MODELS LPC1 and LPC1R

DRAWING NO. 307812

PARTS LIST

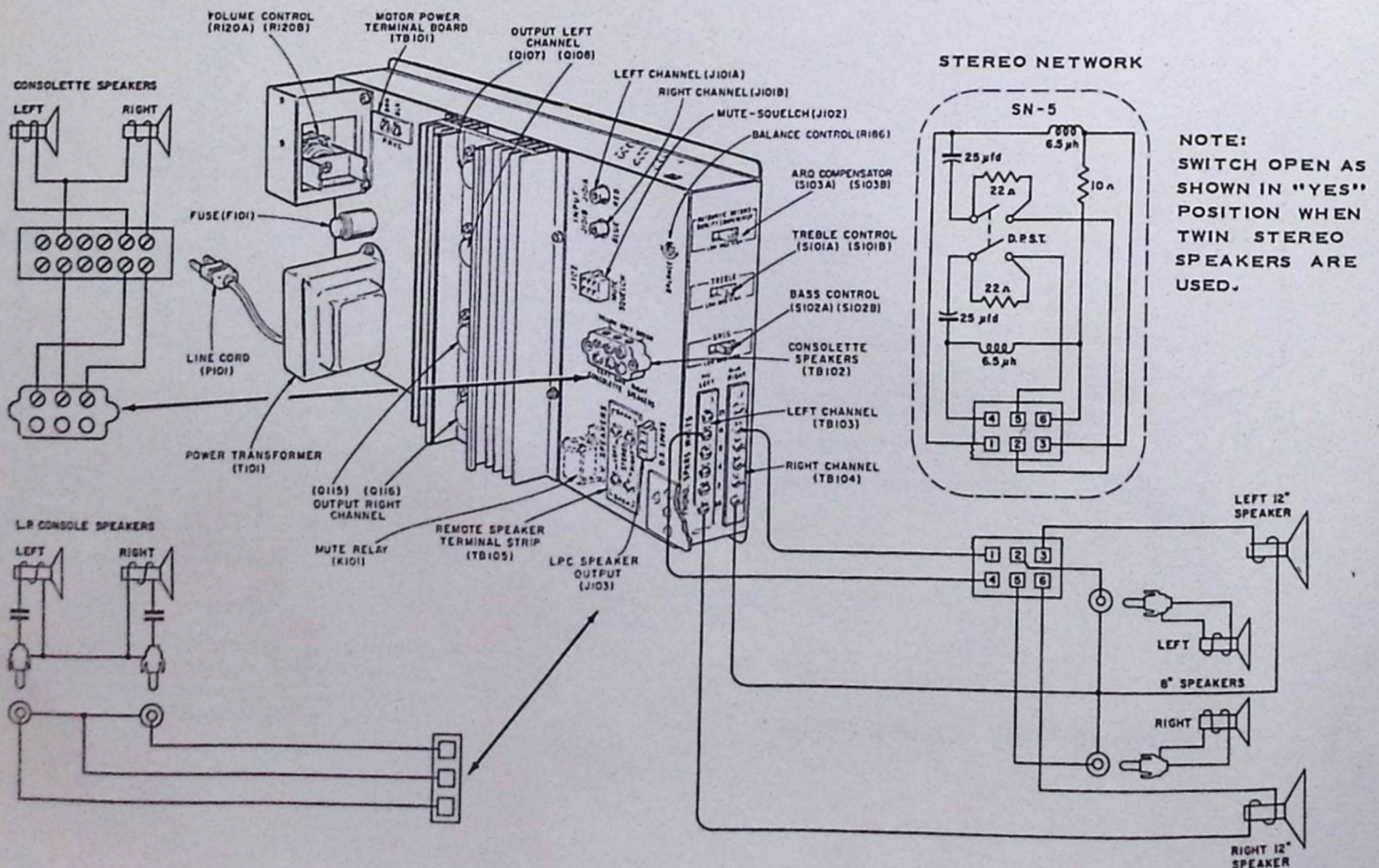
Item	Part No.	Description
1	411278	Service Switch (S797)
2	305635	Credit Switch (S796)
3	307816	Cable Assembly (P796)
4	307818	Cable Assembly (J796)
5	307808	Terminal Board Riveted Assem



NOTES:

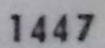
- 1. ADD JUMPER WHEN USED IN HLPC1 (HIDEAWAY) ONLY.
- 2. SERVICE SWITCH ASSEMBLY 307800 FOR LPC1.
- 3. SERVICE SWITCH ASSEMBLY 307801 FOR HLPC1.

Service Switch and Album Pricing Terminal Board.

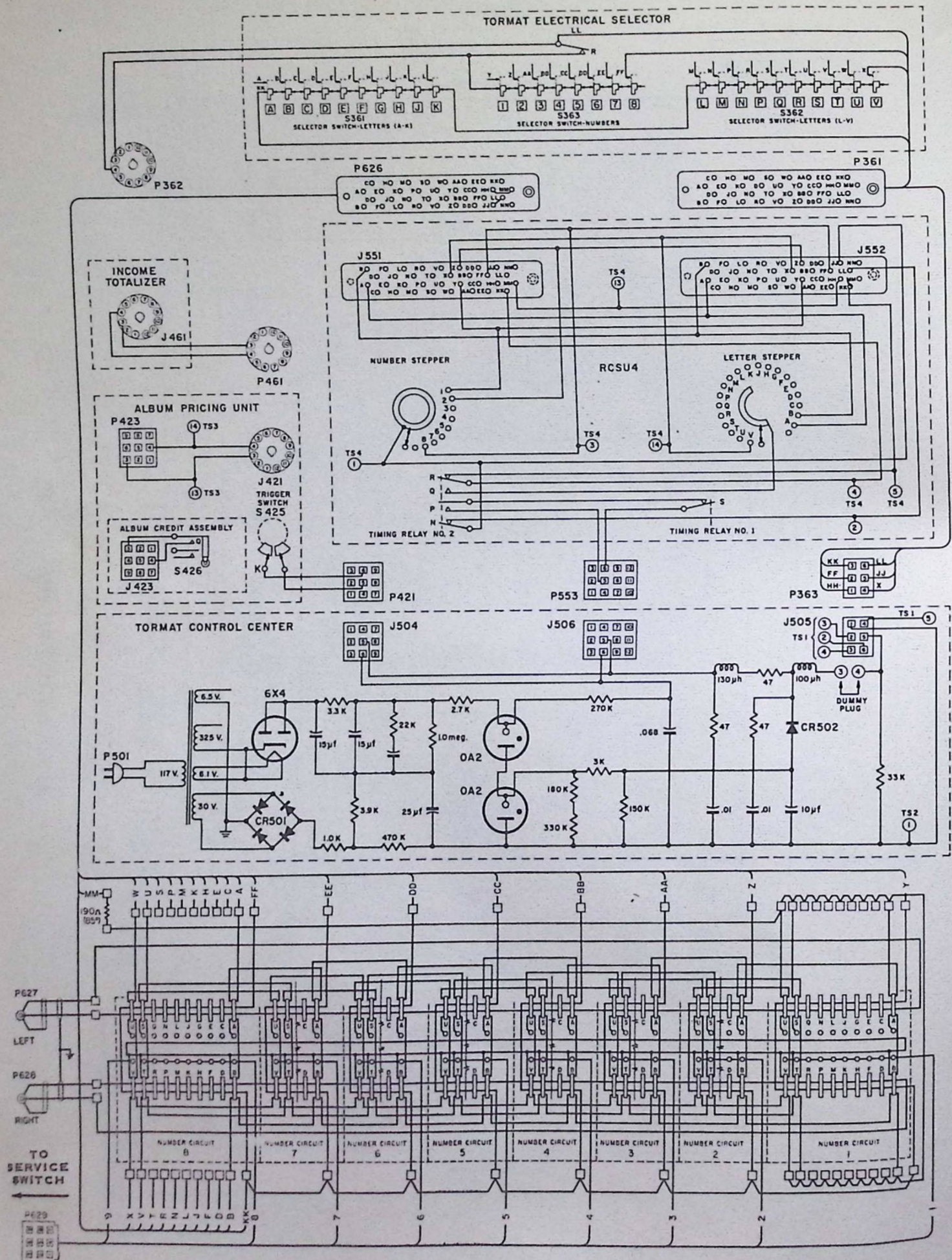


Speaker Circuits.

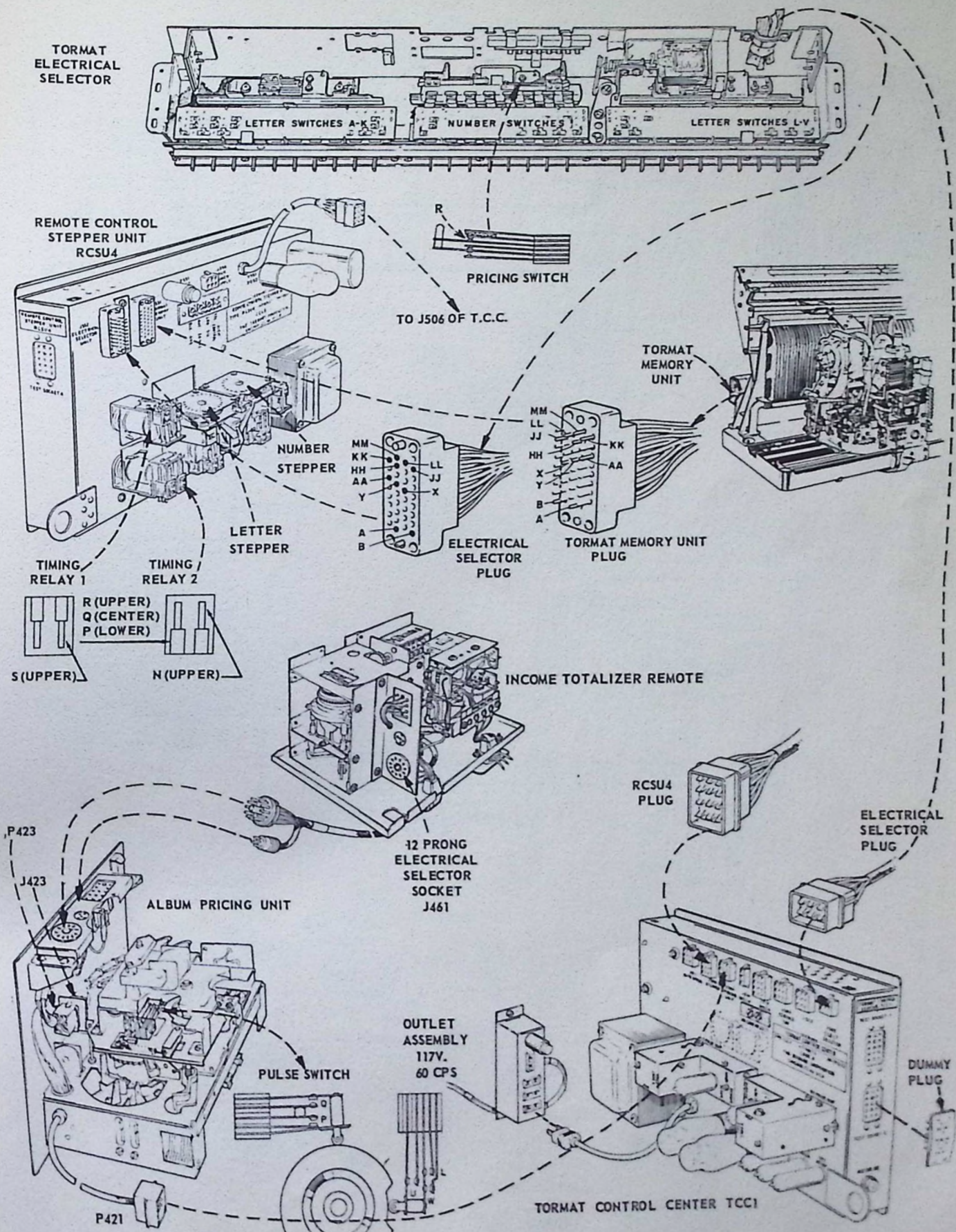
25 Volt and 117 Volt Control Circuits.



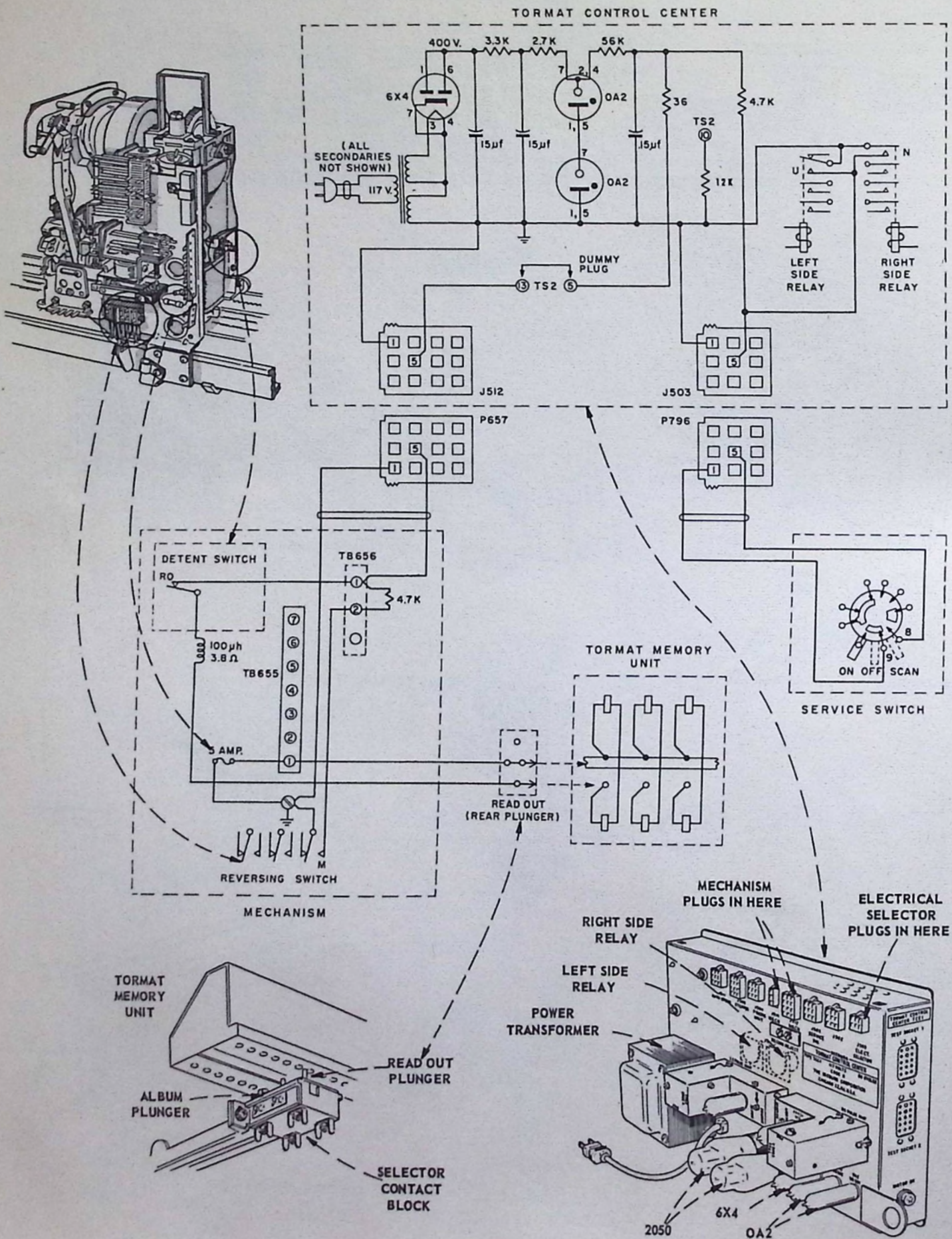
SELECT-O-MATIC MODELS LPC1 and LPC1R WRITE-IN CIRCUITS



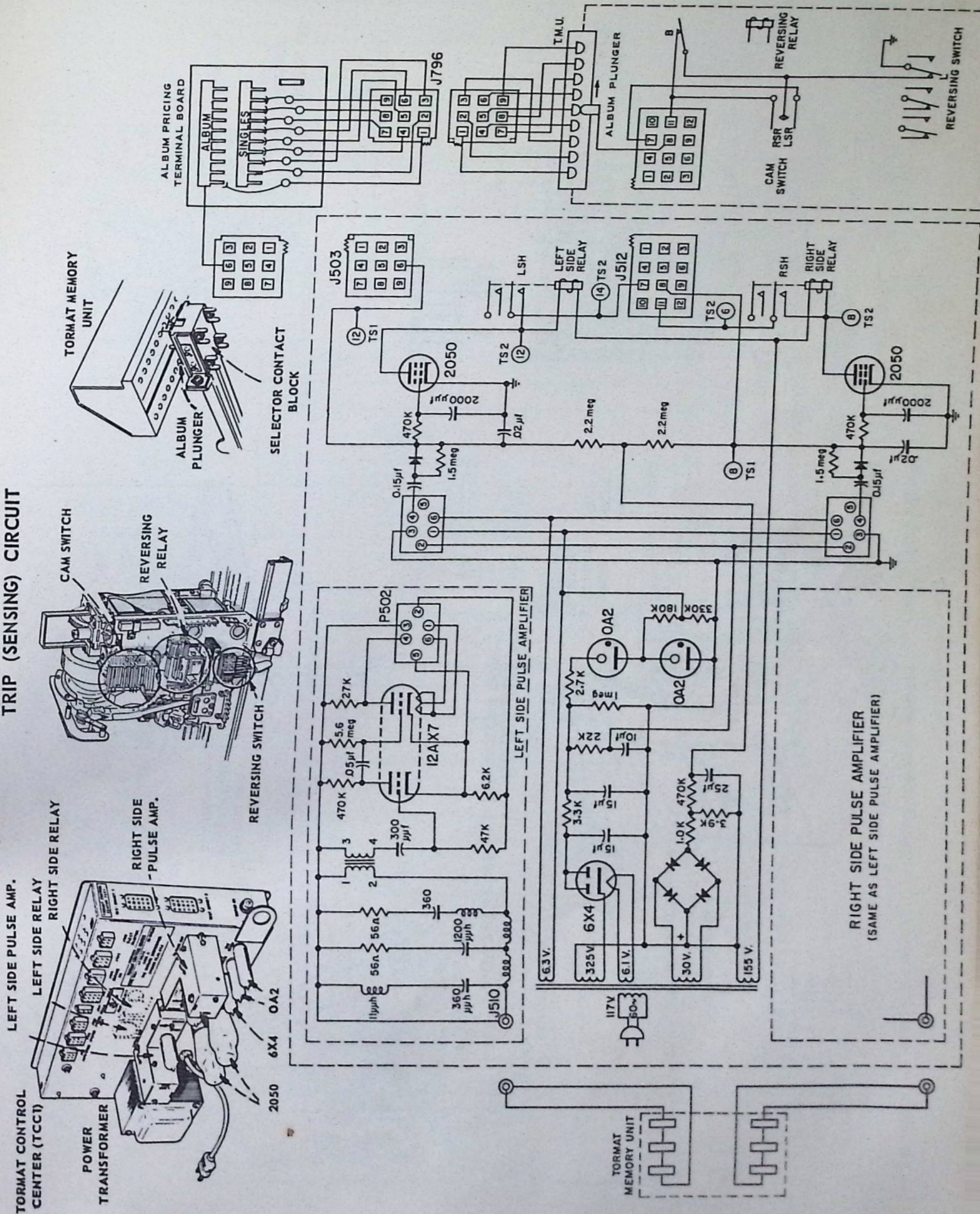
WRITE-IN CIRCUIT COMPONENTS



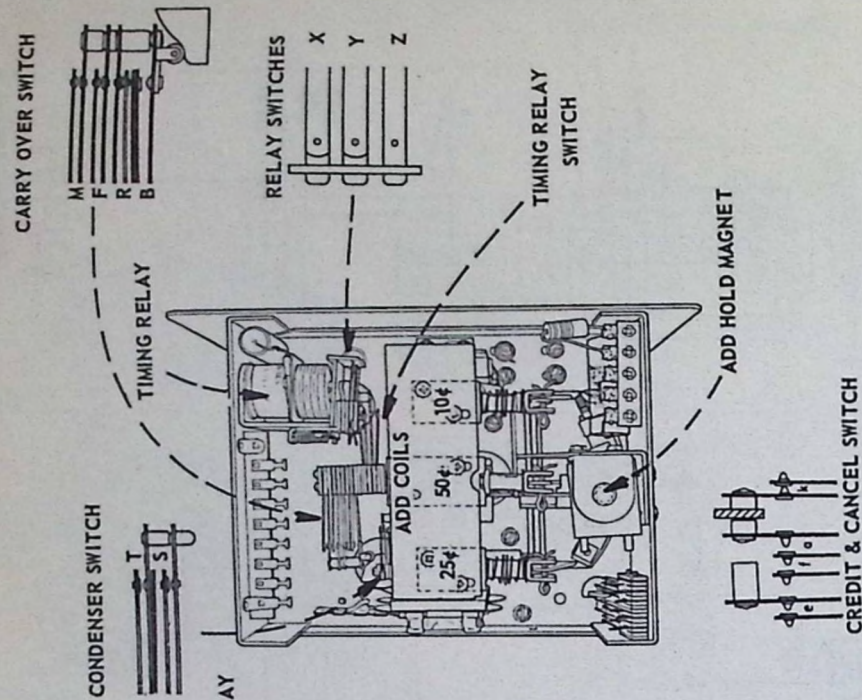
SELECT-O-MATIC MODELS LPC1 and LPC1R READ-OUT CIRCUIT



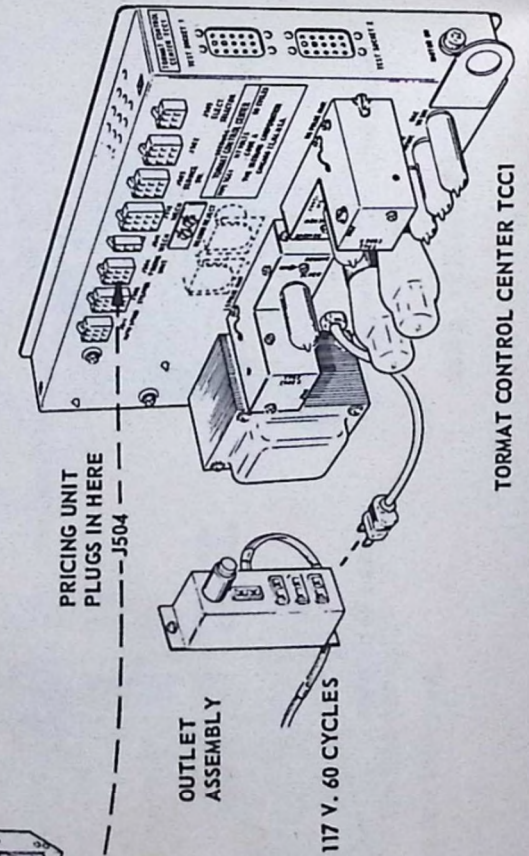
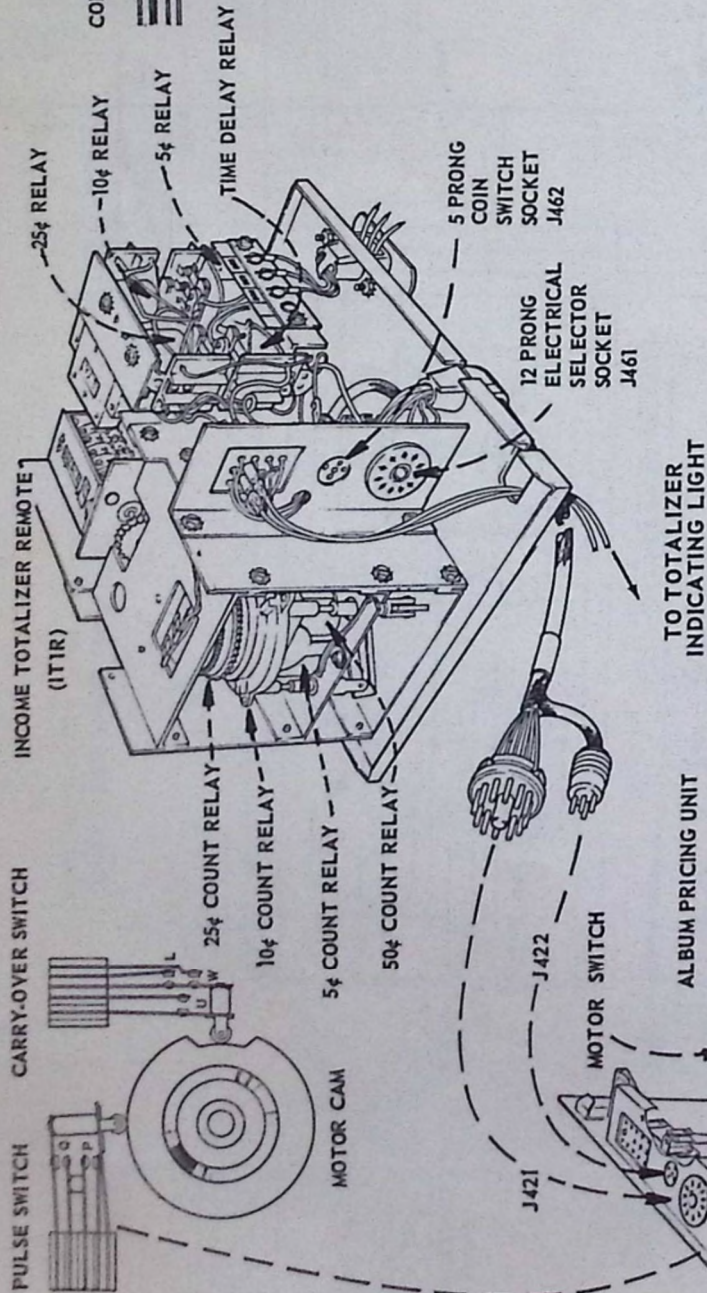
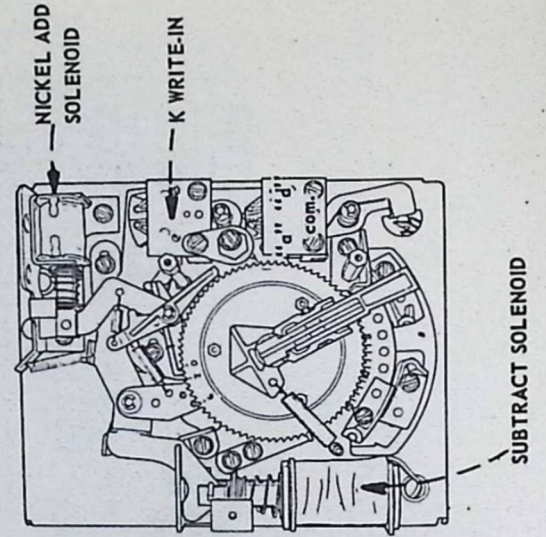
TRIP (SENSING) CIRCUIT



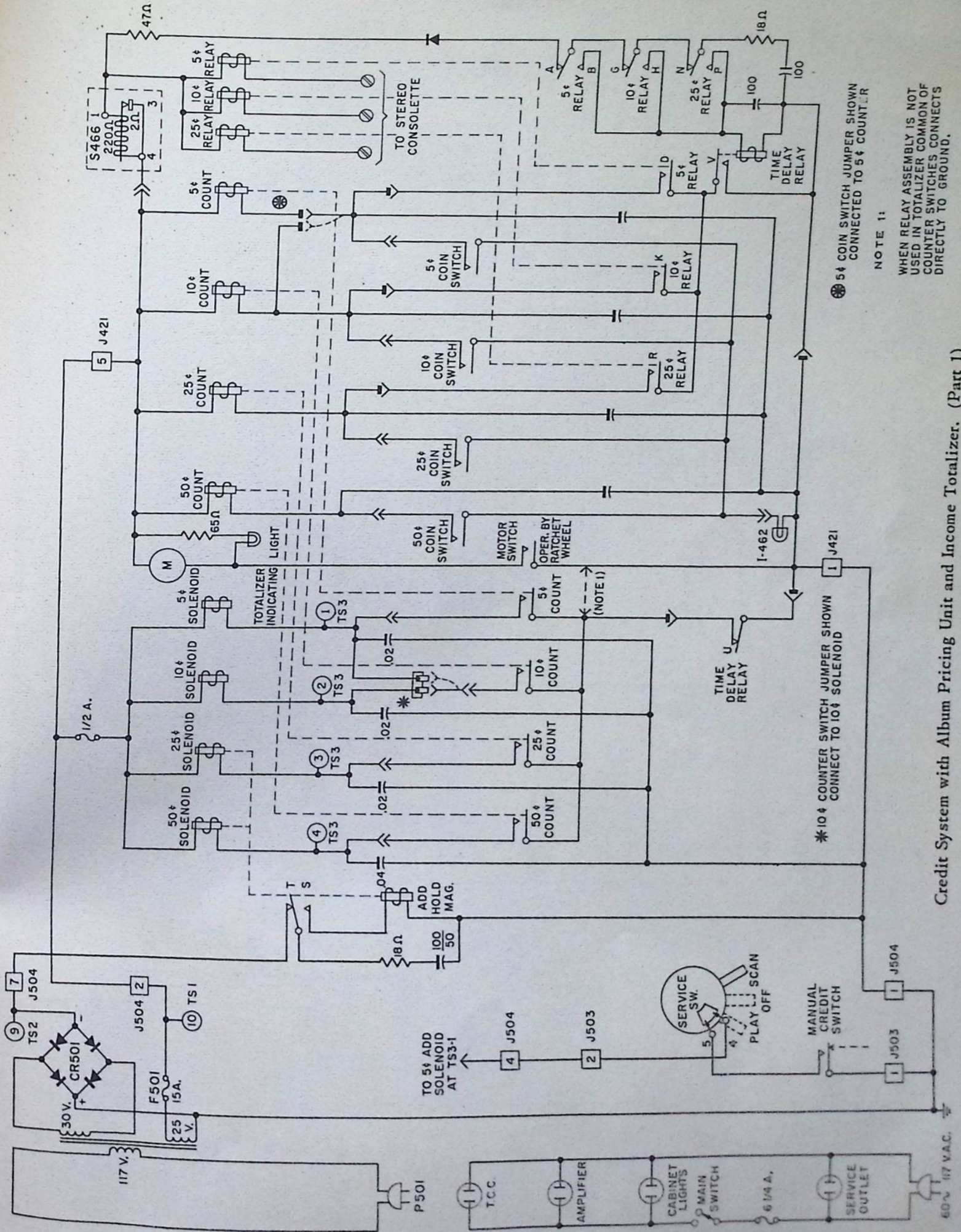
Credit System Components. (Part 1)



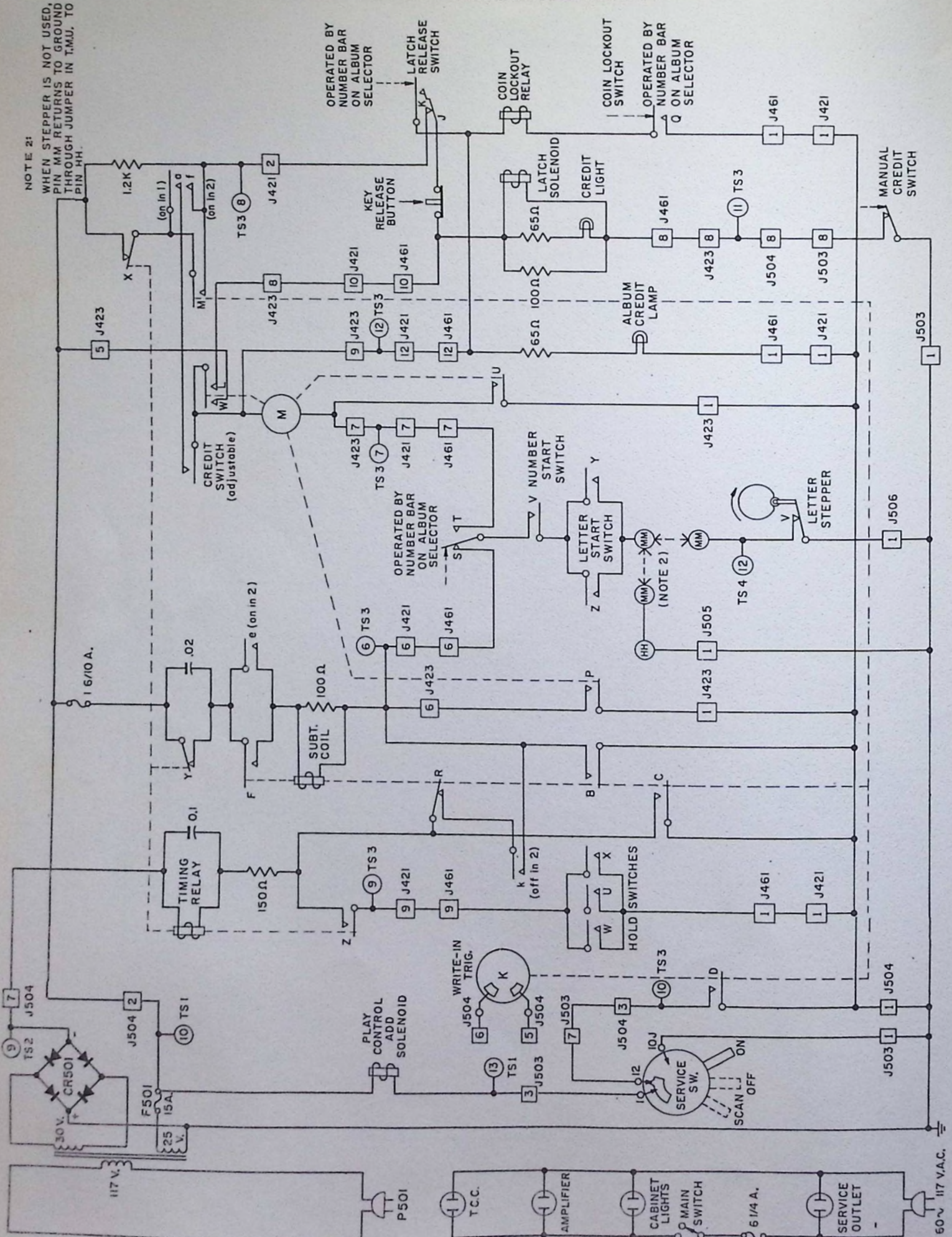
ALBUM PRICING UNIT APU1



SELECT-O-MATIC MODELS LPC1 and LPC1R

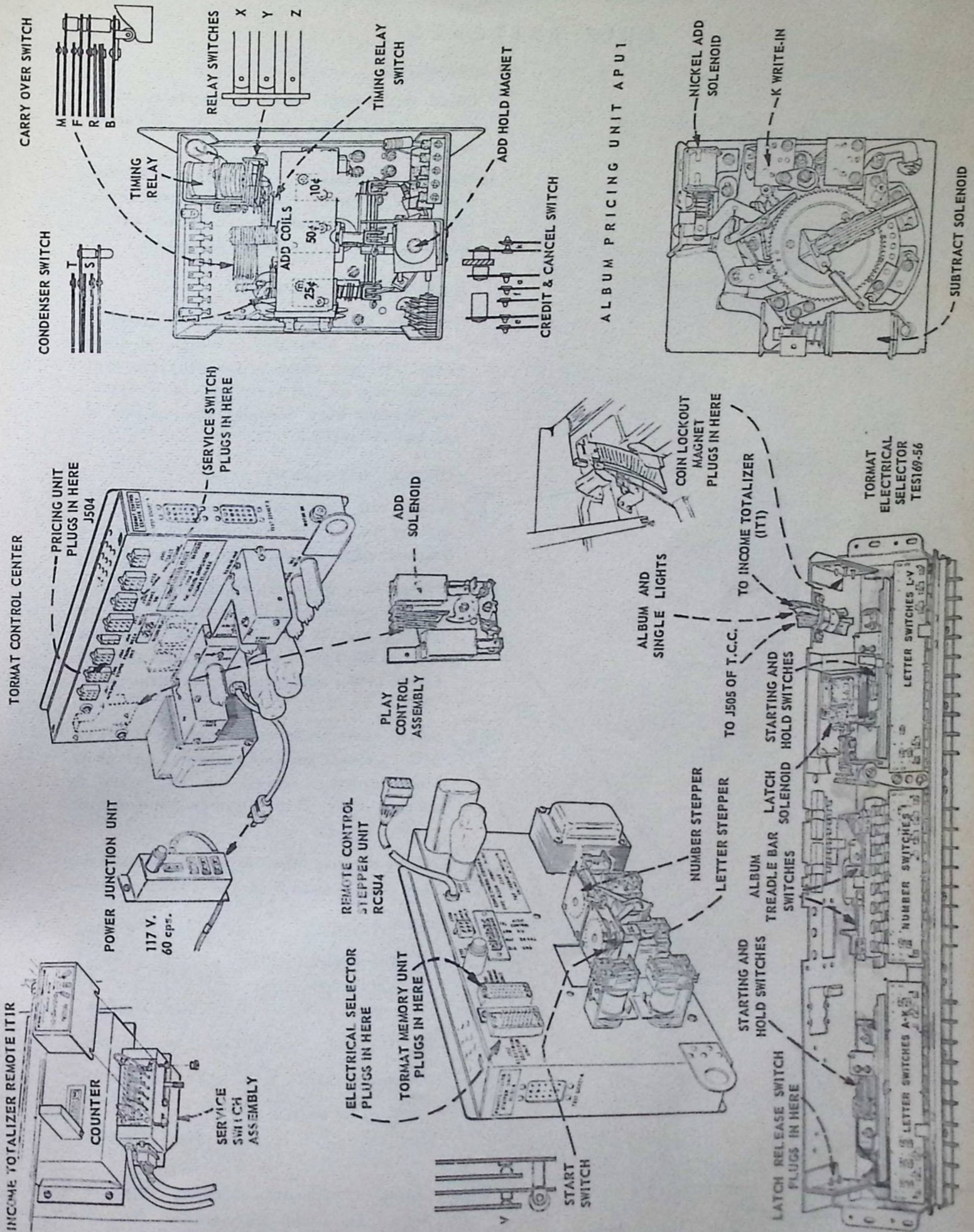


SELECT-O-MATIC MODELS LPC1 and LPC1R



Credit System with Album Pricing Unit and Income Totalizer. (Part 2)

Credit System Components. (Part 2)

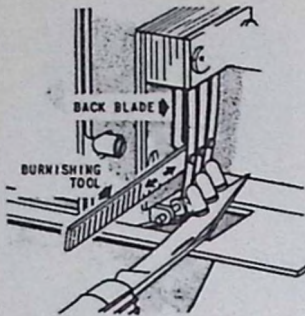


COIN SWITCHES

CLEANING

Clean the switch contacts carefully with carbon tetrachloride using a No. 2 camel hair brush.

Burnish by inserting a burnishing tool between the contacts, raising the switch lever with a knife blade as shown. *Never use a file or sandpaper for contact cleaning.*



COIN LEVER ALIGNMENT

The coin switch levers should be parallel and centered with the openings of their respective coin exits in the slug rejector. Lateral play of the lever should be taken into account when checking the position of the switch levers.

SWITCH ADJUSTMENT

A Adjust the coin switch mounting so the bracket is vertical and parallel with the vertical edge of the slug rejector frame.

B Adjust the coin levers so they are parallel with the bottom edge of the rejector and are bearing against the bracket at "X". The ends of the levers should be approximately $\frac{3}{16}$ " below the level of the lever pivot, "Y".

C Adjust short blade and bracer for $\frac{1}{32}$ " to $\frac{3}{64}$ " contact gap (all switches) with short blade bearing against tip of bracer at approximately 2 to 3 grams (measured at contact point).

D Adjust the long blade so it bears against the cam, as measured at the switch contact:

Nickel switch - 10 to 14 grams

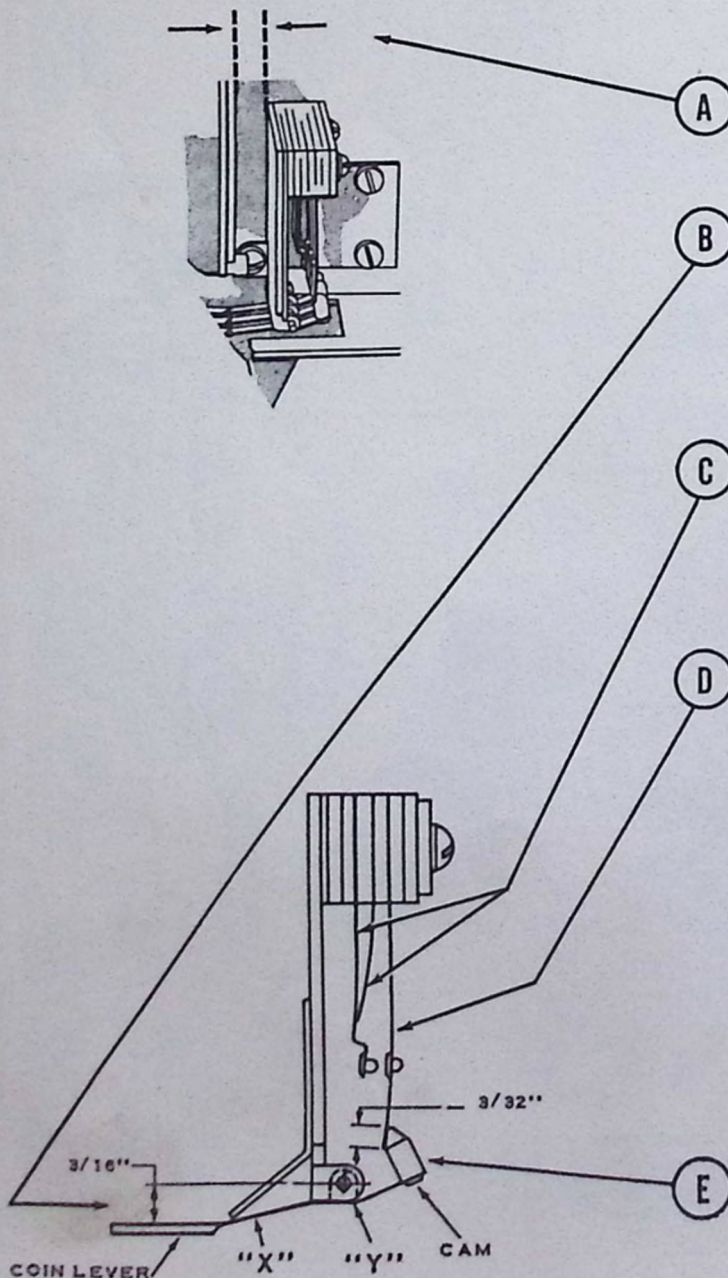
Nickel switch (with flipper equipped slug rejector) - 5 to 7 grams

Dime switch - 5 to 7 grams

Quarter switch - 12 to 16 grams

Half Dollar switch (not shown) - 12 to 16 grams

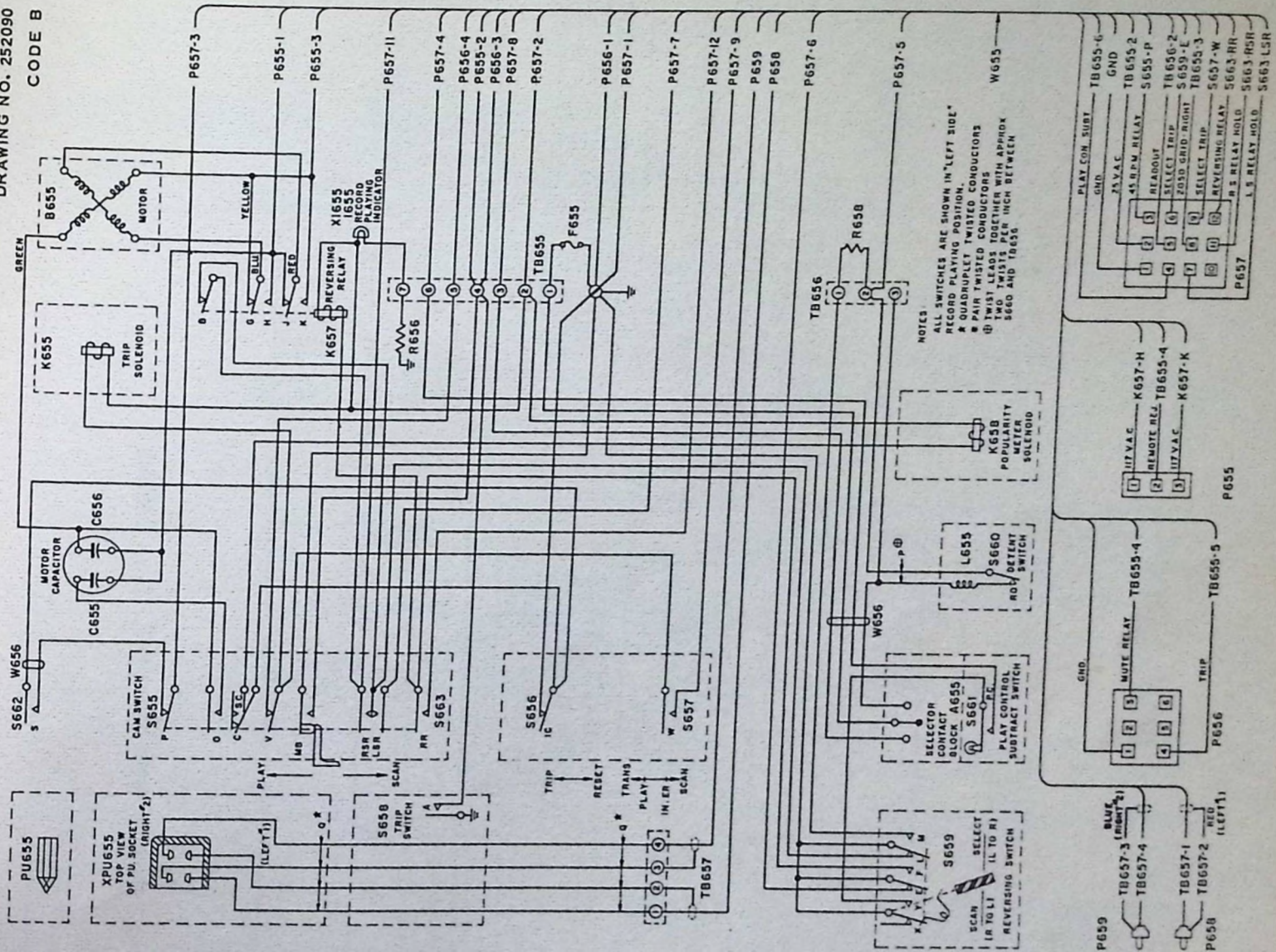
E Adjust the switch actuating cams to be tilted as shown and overlap the switch blade approximately $\frac{3}{32}$ ".



SELECT-O-MATIC MECHANISM, Type 133S1

DRAWING NO. 252090

CODE B



PARTS LIST

Item	Part No.	Description
A655	252082	Contact Block Assem.
B655	252413	Motor Assembly
C655	86321	1.65 mfd Motor Capacitor
C656	0.75 mfd Motor Capacitor	
F655	247850	Fuse - 5 Amp
I655	507522	Indicator Lamp (No 19)
K655	245578	Trip Solenoid
K657	245939	Reversing Relay
K658	249122	Pop. Meter Solenoid
L655	303702	Choke 100μ Henry
P655	803726	Three Contact Cap
P656	487338	Six Contact Cap
P657	307048	Twelve Contact Cap
P658	252922	Single Prong Plug
P659	252922	Single Prong Plug
PU655	249755	Magnetic Pickup
R656	81248	190 ohm 15 W. ± 5%
R658	82432	4700 ohm 1/2 W. ± 10%
S655	252926	Cam Switch
S656	252927	Reset Lever Switch
S657	252927	Clutch Switch
S658	245816	Trip Switch
S659	247846	Reversing Switch Assem.
S660	249235	Detent Switch
S661	248127	Play Control Subtract Sw.
S662	252409	Clamp Arm Switch
S663	252910	Lower Cam Switch
TB655	305113	Terminal Strip
TB656	375299	Terminal Strip
TB657	305112	Terminal Strip
W655	252915	Control Cable
W656	252923	Internal Cable
XL655	252134	Light Housing & Brkt. Assem.
XPU655	249727	PU Cartridge Socket Assembly

SELECT-O-MATIC MECHANISM, Type 133S1

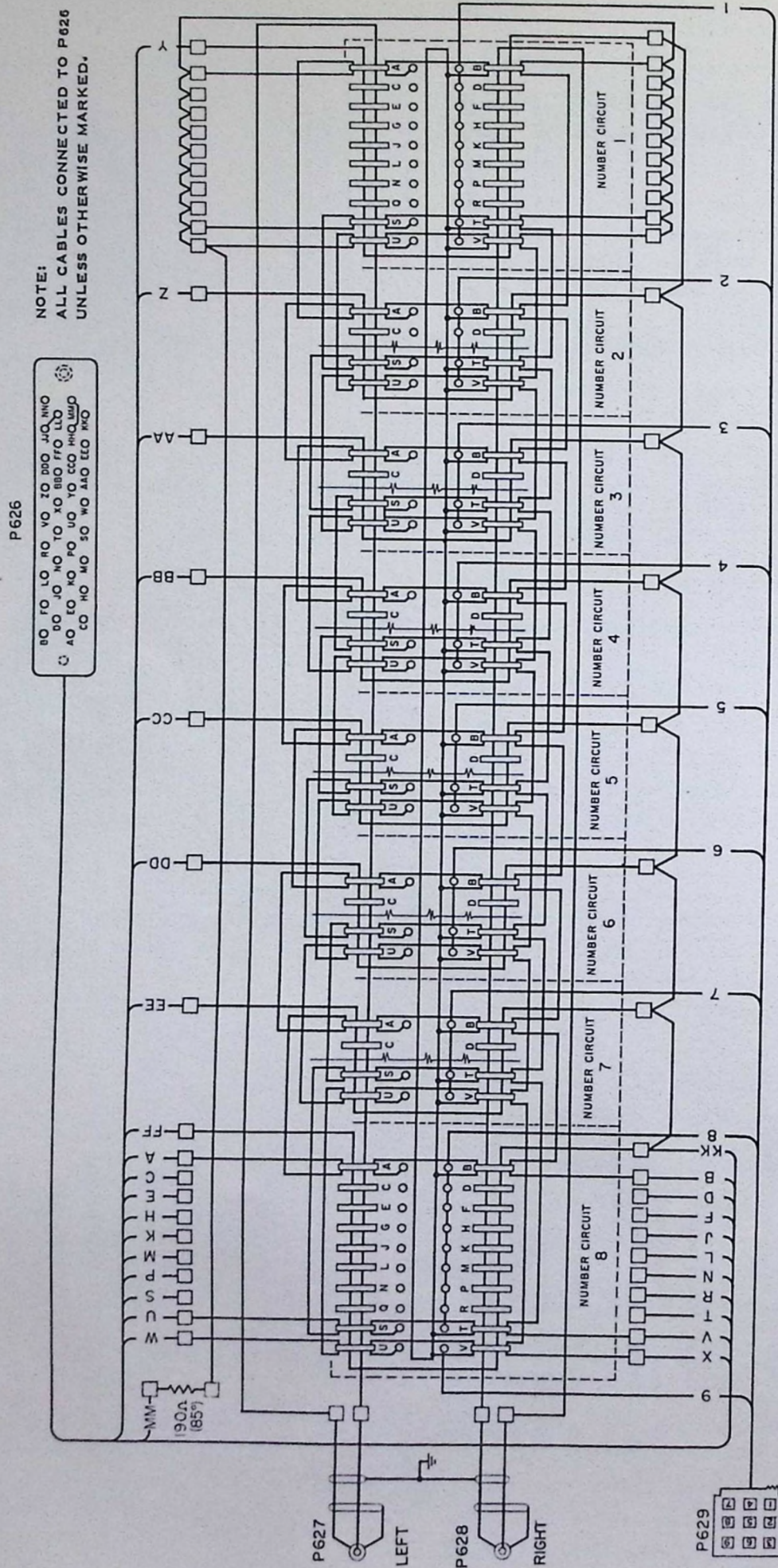
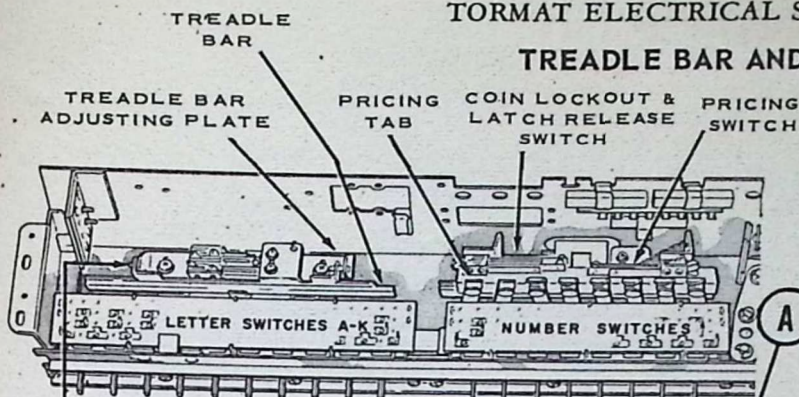


DIAGRAM - TORMAT MEMORY UNIT, Type 160TM2

TREADLE BAR AND SWITCH ADJUSTMENTS



NOTE: All treadle bars should move freely on their pivots to rest against the rubber bumpers and should have a small amount of end play.

With the treadle bar against the rubber bumper in the treadle bar adjusting plate, position the plate (Screws A) so there is $13/64$ inch (.203 inch) separation between the treadle bar and the frame of the selector switch. Use the shank of a No. 6 (.204 inch) or No. 7 (.201 inch) or a $13/64$ inch twist drill for a spacing gage.

The timing of operation of the snap action Start Switches is adjusted by positioning the brackets for the entire switch assembly. **DO NOT ADJUST BY BENDING THE SNAP ACTION SWITCH BLADES.**

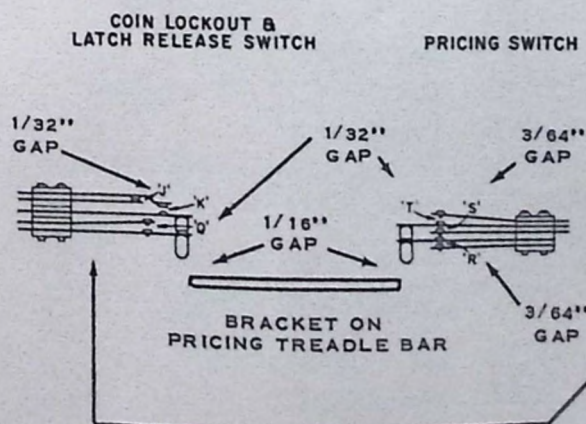
Loosen the bracket holding screws B, and position the switches so the Start Switch contacts close when the selector switches have approximately $1/32$ inch more travel before latching by latch bars.

With all selector switches released:

- (C) Adjust Blade No. 1 so its fibre lift bears against Blade No. 3 approximately 2 oz. (50 grams).
- (D) Adjust Blade No. 2 for $1/64$ inch to $1/32$ inch contact gap.
- (E) Readjust force of Blade No. 1 against Blade No. 3 so Blade No. 2 moves approximately blade thickness ($1/64$ inch) when contacts close.
- (F) Check operation: Hold Switch must close before Start Switch closes and open after Start Switch opens.

Pricing, Coin Lockout & Latch Release Switch Adjustments

With no selector switches operated, set up gaps as shown.



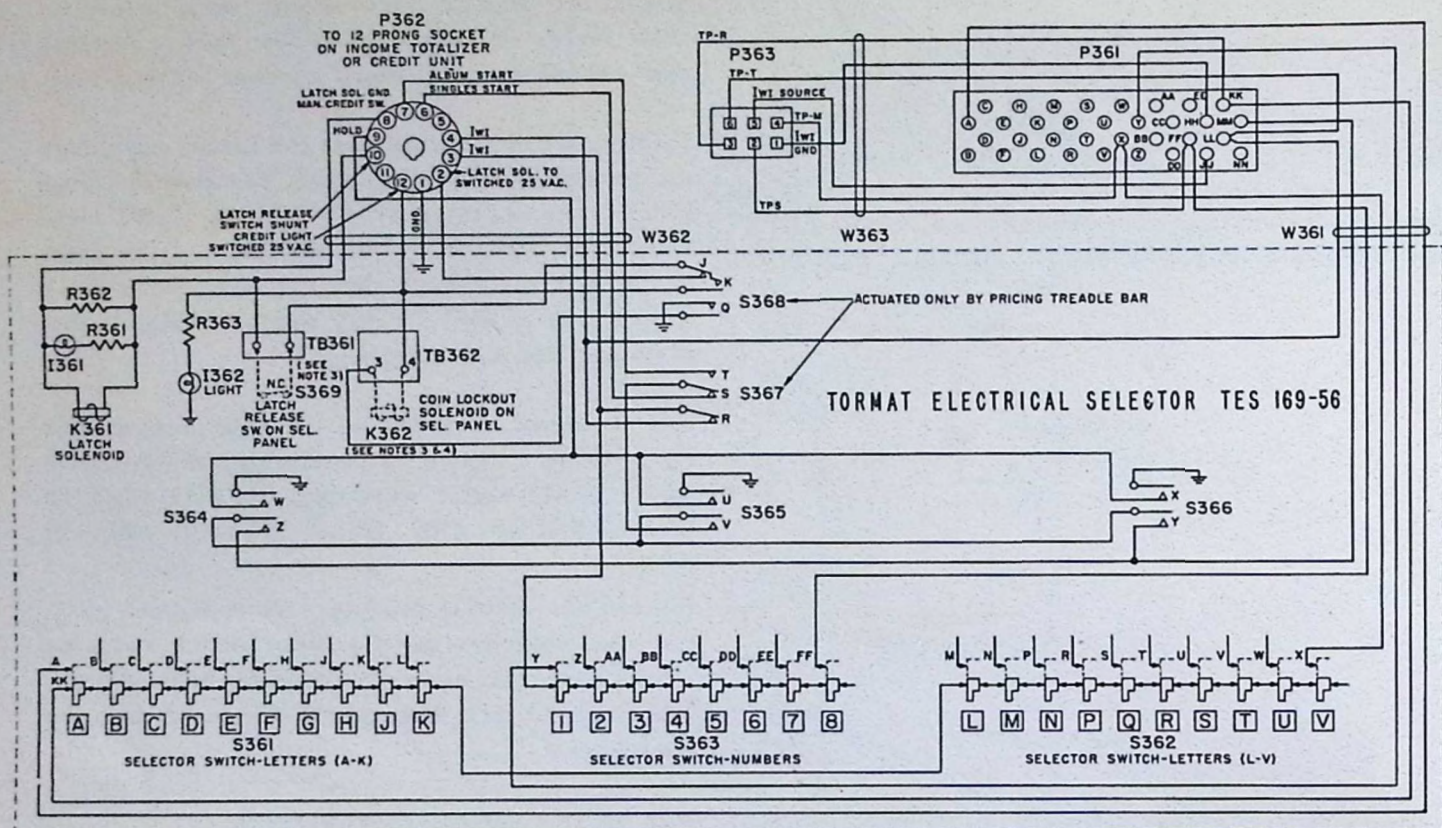
(A) With a Pricing Tab set for "Album Play", operate selector switch, note that "R" contact opens before Start Switch closes. "S" contact opens after "R" contact opens. "T" contact, normally open with $1/32$ inch minimum gap, to close before Start Switch closes.

(B) "Q" contact is normally open. **NOTE:** Switching of all contacts to take place before number Start Switch closes.

(C) Contact pressure as follows:
 "J", "K" and "Q" - 1 ounce.
 "R", "S" and "T" - $1\frac{1}{2}$ ounces.

TORMAT ELECTRICAL SELECTOR, Type TES169-56

DRAWING NO. 411549



NOTES:

1. ALL PLUG AND SOCKET CONNECTIONS SHOWN ARE ASVIEWED FROM CABLESIDE.
2. ALL SWITCHES ARE SHOWN IN NORMAL (NON-OPERATED) POSITION.
3. S369 & K362 ARE PHYSICALLY PARTS OF THE OVERALL CABINET ASSEMBLY AND ARE ELECTRICALLY CONNECTED TO PINS ON TB361 & TB362 BY MEANS OF SEPARABLE CONNECTORS.
4. ON 50 CYCLE PHONOGRAPHS K362 IS PART NO. 487470.

Schematic Diagram for Tormat Electrical Selector, Type TES169-56. (Code B)

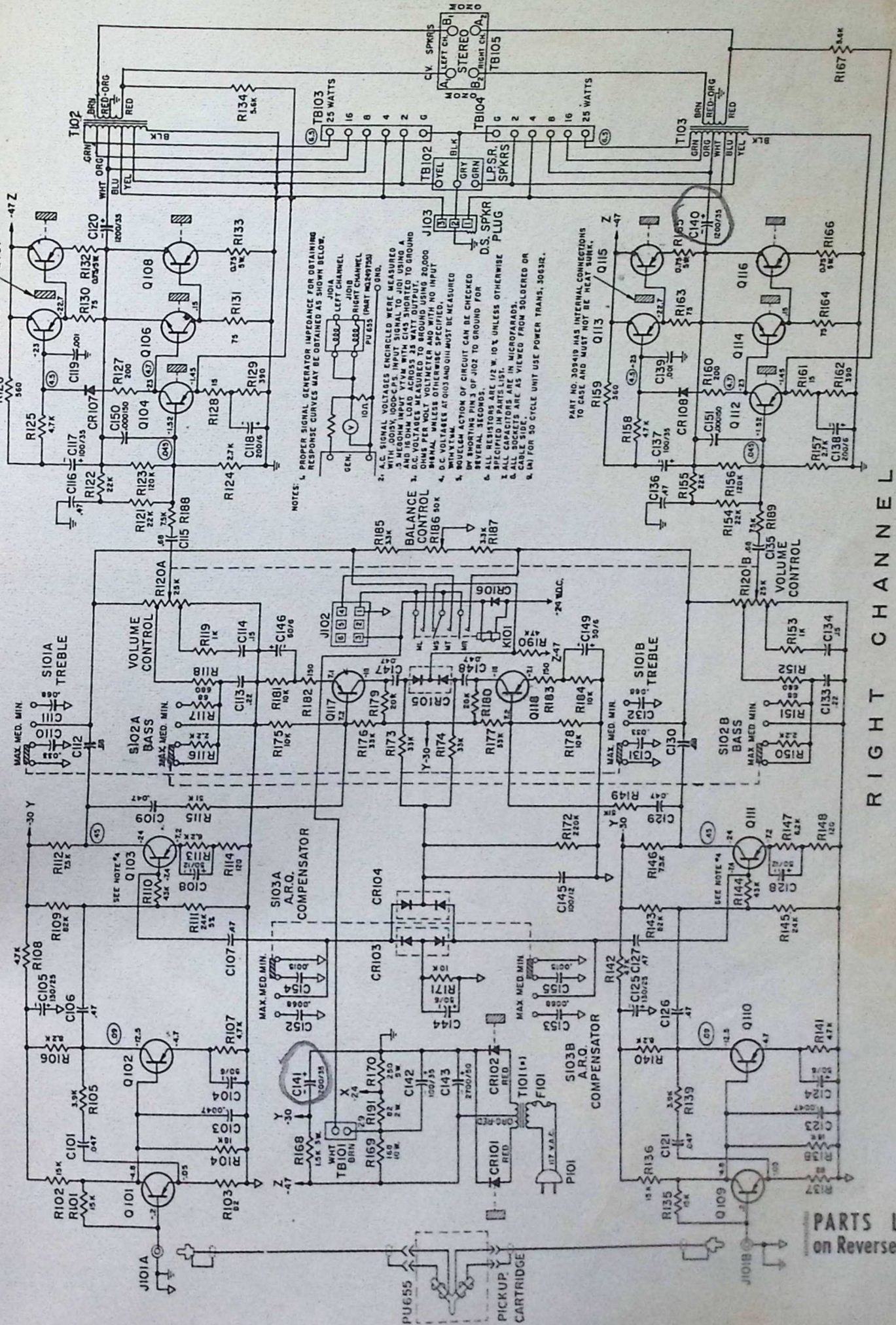
Item	Part No.	Description	Item	Part No.	Description
-	411042	Tormat Elec. Selector, Type TES169 -56	S361	411507	Selector Switch (A - K)
1361 }	411540	Credit Light Socket & Cable Assembly	S362	411509	Selector Switch (L - V)
1362 }	505173	Panel Lamp No. 55	S363	411511	Selector Switch (Number)
K361	410726	Latch Solenoid	S364	411073	Snap Switch
K362	487416	Coin Lockout Magnet Assembly (See Note 4)	S365	411073	Snap Switch
P361	411557	Female Block	S366	411073	Snap Switch
P362	410708	Plug, 12 Prong	S367	411525	Pricing Switch
P363	411556	6-Contact Socket	S368	411597	Coin Lockout & Latch Release Switch
R361	81178	Resistor 65 Ohm., 10 W.	S369	487159	Miniature Snap Switch
R362	81183	Resistor 100 Ohm., 10 W.	TB361	411537	Terminal Board Assembly
R363	81178	Resistor 65 Ohm., 10 W.	TB362	411537	Terminal Board Assembly
			W361	411533	Matrix Cable
			W362	411539	Control Cable
			W363	411535	Write-In Cable

TRANSISTORIZED STEREO AMPLIFIER, Type TSA1

LEFT CHANNEL

DRAWING NO. 306340

PART NO 309419 HAS INTERNAL CONNECTION TO CASE AND MUST NOT BE HEAT SUNK.



NOTES:
1. PROPER SIGNAL GENERATOR IMPEDANCE FOR OBTAINING RESPONSE CURVES MAY BE OBTAINED AS SHOWN BELOW.
2. A.C. SIGNAL VOLTAGES ENCIRCLED WERE MEASURED 3. MEDIUM H.F. INPUT SIGNAL TO J101 USING A 100 OHM LOAD ACROSS TO GROUND. 4. D.C. VOLTAGES MEASURED TO BEHOLD OUTPUT. 5. PER VOLT VOLTMETER AND WITH NO INPUT SIGNAL. 6. D.C. VOLTAGE AT Q108 AND Q107 MUST BE MEASURED WITH T.M.M. 7. SQUELCH ACTION OF CIRCUIT CAN BE CHECKED BY SHORTING PIN 3 OF J102 TO GROUND FOR SEVERAL SECONDS. 8. ALL RESISTORS ARE 1/2 W. 10% UNLESS OTHERWISE SPECIFIED IN PARTS LIST. 9. ALL CAPACITORS ARE IN MICROFARADS. 10. ALL SOCKETES ARE AS VIEWED FROM SOLENOID OR CABLE SIDE. 11. 50 CYCLE UNIT USE POWER TRANS. 306342.

RIGHT CHANNEL

Schematic Diagram for Transistorized Stereo Amplifier, Type TSA1. (Code D)

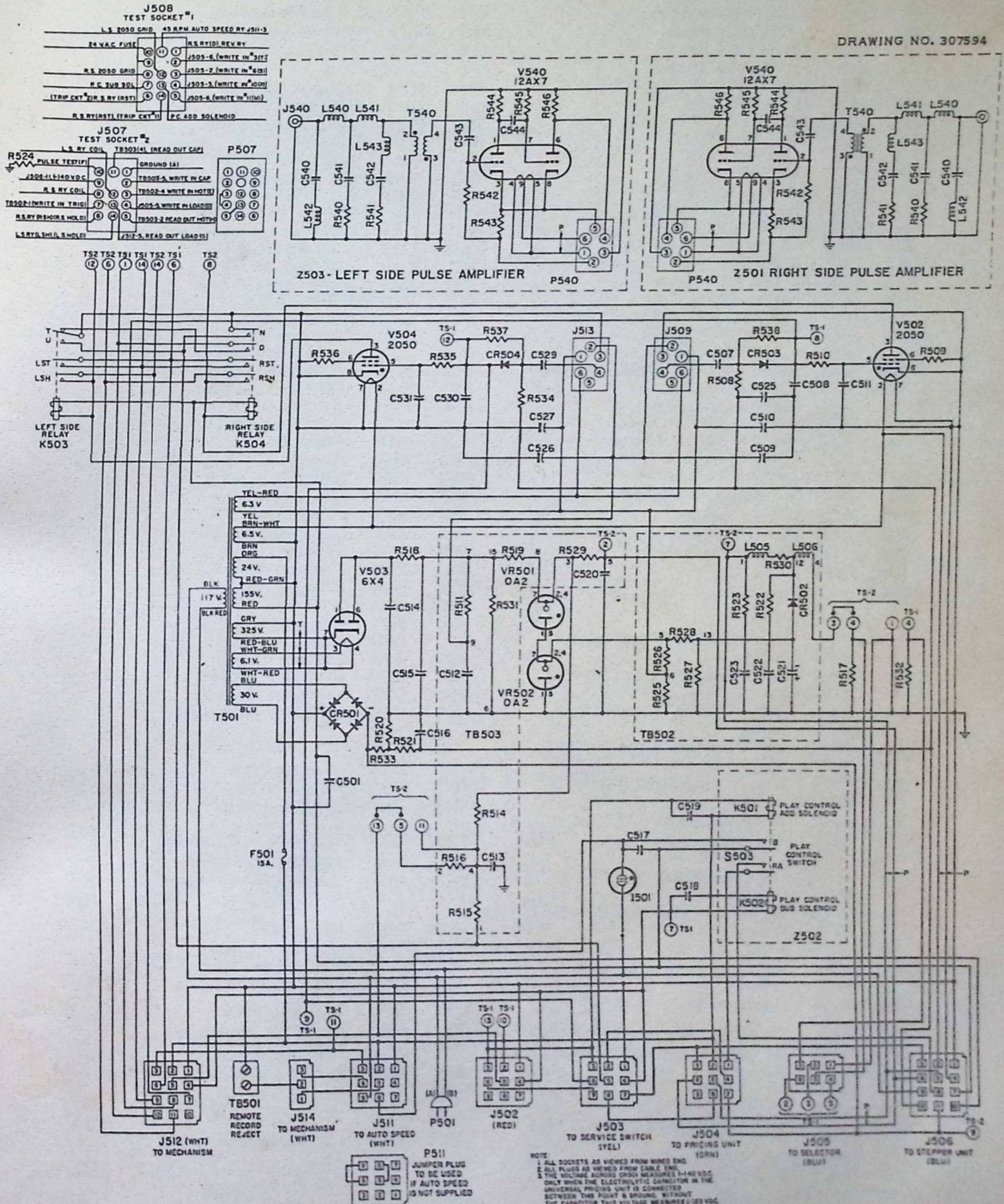
PARTS LIST on Reverse Side

TRANSISTORIZED STEREO AMPLIFIER, Type TSA1

Item	Part No.	Description	Item	Part No.	Description	Item	Part No.	Description	Item	Part No.	Description
C101	86327	0.047 Mfd. 50 V. Mylar	C152	86332	0.0068 Mfd. 50 V. Mylar	R109	82447	82000 Ohm 1/2 W. 10%	R157	82670	2700 Ohm 1/2 W. 5%
C103	86330	0.0047 Mfd. 50 V. Mylar	C153			R110	82678	43000 Ohm 1/2 W. 5%	R158	82630	6800 Ohm 1/2 W. 5%
C104	87696	50 Mfd. 6 V. Lytic	C154	86240	0.0015 Mfd. Ceramic	R111	82605	24000 Ohm 1/2 W. 5%	R159	82421	560 Ohm 1/2 W. 10%
C105	87717	130 Mfd. 25 V. Lytic	C155			R112	82631	7500 Ohm 1/2 W. 5%	R160	82686	240 Ohm 1/2 W. 5%
C106	86329	0.47 Mfd. 50 V. Mylar				R113	82610	6200 Ohm 1/2 W. 5%	R161	82402	15 Ohm 1/2 W. 10%
C107						R114	82413	120 Ohm 1/2 W. 10%	R162	82688	330 Ohm 1/2 W. 5%
C108	87703	50 Mfd. 12 V. Lytic	CR101	309387	Silicon Rectifier U-212	R115	82796	51000 Ohm 1/2 W. 5%	R163	82649	75 Ohm 1/2 W. 5%
C109	86327	0.047 Mfd. 50 V. Mylar	CR102			R116	82428	2200 Ohm 1/2 W. 10%	R164		
C110	86336	0.033 Mfd. 50 V. Mylar	CR103	309398	Dual Selenium Diode	R117	82410	68 Ohm 1/2 W. 10%	R165	81231	0.75 Ohm 5 W. 10%
C111	86351	0.068 Mfd. 50 V. Mylar	CR104	309397	Dual Selenium Diode	R118	82422	680 Ohm 1/2 W. 10%	R166	82433	5600 Ohm 1/2 W. 10%
C112	86354	0.68 Mfd. 50 V. Mylar	CR105	309399	Dual Selenium Diode	R119	82424	1000 Ohm 1/2 W. 10%	R167	81242	1500 Ohm 3 W. 10%
C113	86331	22 Mfd. 50 V. Mylar	CR106			R120A	306318	Volume Control 25,000 Ohm.	R168	81243	168 Ohm 10 W. 10%
C114	86303	0.15 Mfd. 50 V. Mylar	CR107	309384	Semi Conductor Rectifier (Silicon)	R120B			R169	81201	250 Ohm 5 W. 10%
C115	86354	0.68 Mfd. 50 V. Mylar	CR108			R121	82639	22000 Ohm 1/2 W. 5%	R170	82436	10,000 Ohm 1/2 W. 10%
C116	86329	0.47 Mfd. 50 V. Mylar				R122	82899	120,000 Ohm 1/2 W. 5%	R171	82452	220,000 Ohm 1/2 W. 10%
C117	87700	130 Mfd. 35 V. Lytic	F101	306316	8/10 Amp. Slo-Blo	R123	82670	2700 Ohm 1/2 W. 5%	R172	82442	33,000 Ohm 1/2 W. 10%
C118	87702	200 Mfd. 6 V. Lytic				R124	82630	6800 Ohm 1/2 W. 5%	R173	82436	10,000 Ohm 1/2 W. 10%
C119	86309	0.001 Mfd. Ceramic	J101A	306306	Input Socket	R125	82421	560 Ohm 1/2 W. 10%	R174	82442	33,000 Ohm 1/2 W. 10%
C120	87718	1200 Mfd. 35 V. Lytic	J101B	306302	Mute Jack	R126	82686	240 Ohm 1/2 W. 5%	R175	82442	33,000 Ohm 1/2 W. 10%
C121	86327	0.047 Mfd. 50 V. Mylar	J102	803725	D.S. Output Jack	R127	82402	15 Ohm 1/2 W. 10%	R176	82436	10,000 Ohm 1/2 W. 10%
C123	86330	0.0047 Mfd. 50 V. Mylar	J103	306352	Mute Trip Relay	R128	82688	390 Ohm 1/2 W. 5%	R177	82601	20,000 Ohm 1/2 W. 10%
C124	87696	50 Mfd. 6 V. Lytic	K101			R129	82649	75 Ohm 1/2 W. 5%	R178	82436	10,000 Ohm 1/2 W. 10%
C125	87717	130 Mfd. 25 V. Lytic	Q101	309413	GC-112A PNP Low Noise Germ. Transistor	R130	81231	0.75 Ohm 5 W. 10%	R179	82414	150 Ohm 1/2 W. 10%
C126	86329	0.47 Mfd. 50 V. Mylar	Q102	309420	GC-112 PNP Germ. Transistor	R131	82433	5600 Ohm 1/2 W. 10%	R180	82436	10,000 Ohm 1/2 W. 10%
C127			Q103	309421	GC-380 PNP High Gain Germ. Transistor	R132	308967	15000 Ohm 1/2 W. 10%	R181	82631	7500 Ohm 1/2 W. 5%
C128	87703	50 Mfd. 12 V. Lytic	Q104	309419	SC-365 PNP Silicon Transistor	R133	82432	4700 Ohm 1/2 W. 10%	R182	82444	47000 Ohm 1/2 W. 10%
C129	86327	0.047 Mfd. 50 V. Mylar	Q105	309418	SC-350 NPN Silicon Transistor	R134	82447	82000 Ohm 1/2 W. 10%	R183	306329	Treble Switch
C130	86354	0.68 Mfd. 50 V. Mylar	Q106	309412	GC-114 PNP Germ. Power Transistor	R135	82478	43000 Ohm 1/2 W. 5%	R184	306329	Bass Switch
C131	86336	0.033 Mfd. 50 V. Mylar	Q107	309413	GC-112A PNP Low Noise Germ. Transistor	R136	82605	24000 Ohm 1/2 W. 5%	R185	306329	Auto. Record Quality Compensator
C132	86351	0.068 Mfd. 50 V. Mylar	Q108	309414	GC-112 PNP Germ. Transistor	R137	82610	6200 Ohm 1/2 W. 5%	R186	306312	Power Transformer for 50 cycles
C133	86331	0.22 Mfd. 50 V. Mylar	Q109	309415	GC-112 PNP Germ. Transistor	R138	82413	120 Ohm 1/2 W. 10%	R187	306311	Power Transformer for 60 cycles
C134	86303	0.15 Mfd. 50 V. Mylar	Q110	309416	GC-380 PNP High Gain Germ. Transistor	R139	82796	51000 Ohm 1/2 W. 5%	R188	306314	Output Transformer
C135	86354	0.68 Mfd. 50 V. Mylar	Q111	309420	GC-380 PNP High Gain Germ. Transistor	R140	82428	2200 Ohm 1/2 W. 10%	R189	306313	Output Transformer
C136	86329	0.47 Mfd. 50 V. Mylar	Q112	309421	RCA 34573 PNP Germ. Transistor	R141	82410	68 Ohm 1/2 W. 10%	R190	306343	2 Lug Terminal Board
C137	87700	100 Mfd. 35 V. Lytic	Q113	309419	SC-365 PNP Silicon Transistor	R142	82422	680 Ohm 1/2 W. 10%	R191	306303	3 Lug Terminal Connector
C138	87702	200 Mfd. 6 V. Lytic	Q114	309418	SC-350 NPN Silicon Transistor	R143	82424	1000 Ohm 1/2 W. 10%		306304	6 Lug Terminal Board
C139	86309	0.001 Mfd. Ceramic	Q115	309412	GC-114 PNP Germ. Power Transistor	R144	82639	22000 Ohm 1/2 W. 5%		306338	4 Lug Terminal Board
C140	87718	1200 Mfd. 35 V. Lytic	Q116			R145	82899	120,000 Ohm 1/2 W. 5%			
C141			Q117	309414	GC-112 PNP Germ. Transistor	R146					
C142	87700	100 Mfd. 35 V. Lytic	Q118			R147					
C143	87721	2700 Mfd. 50 V. Lytic				R148					
C144	87696	50 Mfd. 6 V. Lytic	R101	308967	15000 Ohm. 1/2 W. 10%	R149					
C145	87724	100 Mfd. 12 V. Lytic	R102	82411	82 Ohm 1/2 W. 10%	R150					
C146	87696	50 Mfd. 6 V. Lytic	R103	82439	18000 Ohm 1/2 W. 10%	R151					
C147			R104	82626	3900 Ohm 1/2 W. 5%	R152					
C148	86327	0.047 Mfd. 50 V. Mylar	R105	308968	8200 Ohm 1/2 W. 10%	R153					
C149	87696	50 Mfd. 6 V. Lytic	R106	82432	4700 Ohm 1/2 W. 10%	R154					
C150	86243	0.000150 Mfd. Ceramic	R107			R155					
C151			R108			R156					

TORMAT CONTROL CENTER, Type TCC1 and TCC2

DRAWING NO. 307594



Schematic Diagram (Code A)

13043

TORMAT CONTROL CENTER, Type TCC1 and TCC2

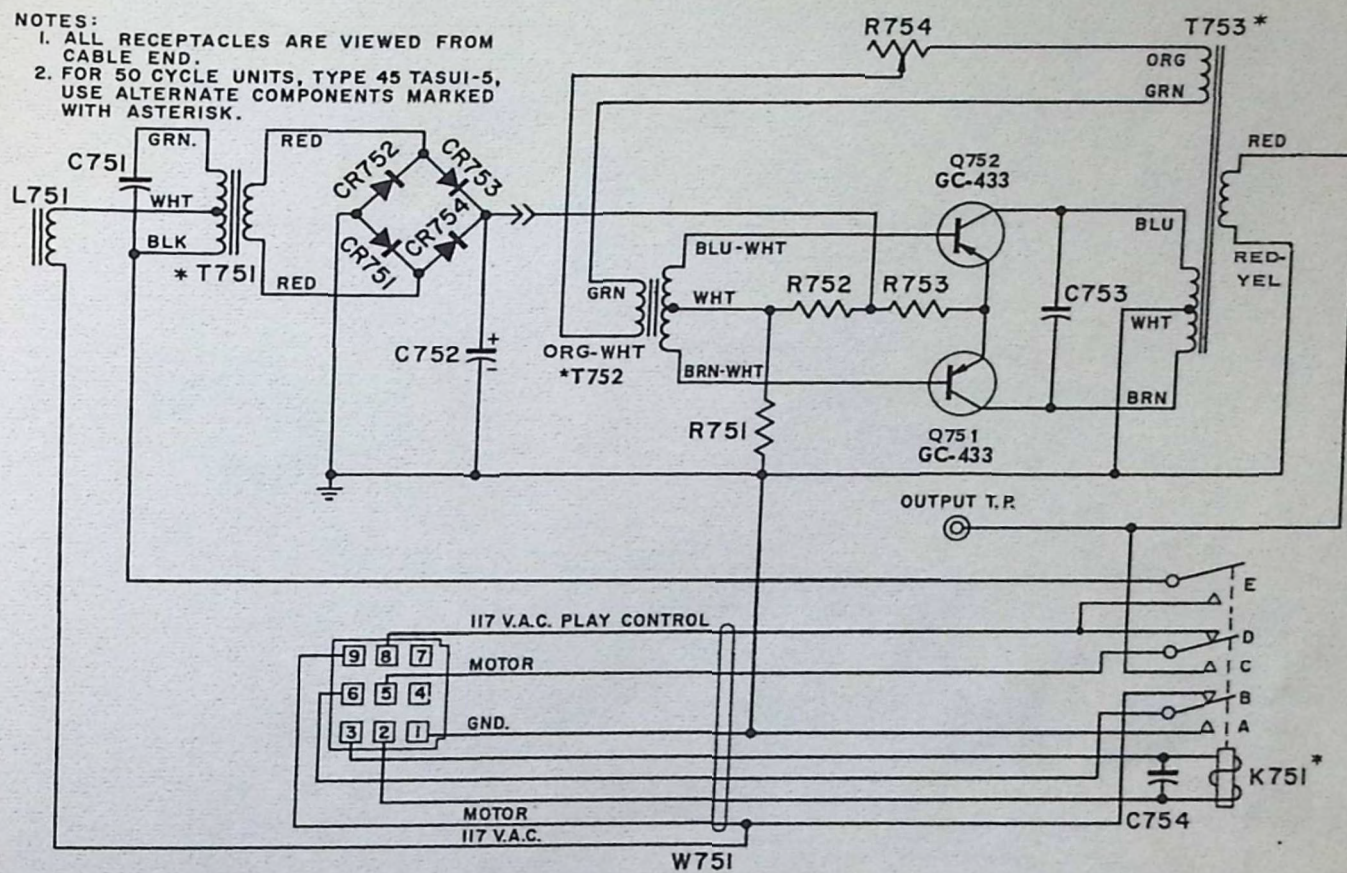
Item	Part No.	Description	Item	Part No.	Description
C501	86154	0.02 Mfd. 600 V. Paper	P501	307589	Line Cord & Plug Assembly
C507	86248	0.15 Mfd. $\pm 10\%$ 200 V. Paper	P507	307557	12 Prong Plug Assembly
C508	86154	0.02 Mfd. 600 V. Paper	P511	307598	Auto-Speed Replacement Jumper Plug Assem.
C509	86251	3000 Mmf 500 V. Ceramic	P540	303599	6 Prong Plug
C510	86313	0.01 Mfd. 500 V. Ceramic			
C511	86255	2000 Mmf 500 V. Ceramic	R508	82464	2.2 Megohm $\pm 10\%$ $\frac{1}{2}$ W.
C512	87637	10 Mfd. 450 V. Lytic	R509	82440	22,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C513	86296	0.15 Mfd. $\pm 10\%$ 600 V. Paper	R510	82456	470,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C514	87635	15 Mfd. 450 V. Lytic	R511	308975	27,000 Ohm $\pm 5\%$ 2 W.
C515	87635	15 Mfd. 450 V. Lytic	R514	82837	56,000 Ohms $\pm 10\%$ 2 W.
C516	87571	25 Mfd. 50 V. Lytic	R515	82432	4,700 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C517	86317	0.01 Mfd. 1400 V. Ceramic	R516	308971	36 Ohms $\pm 5\%$ $\frac{1}{2}$ W.
C518	86313	0.01 Mfd. 500 V. Ceramic	R517	82442	33,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C519	86313	0.01 Mfd. 500 V. Ceramic	R518	81194	3,300 Ohms Fuse Resistor $\pm 10\%$ 5 W.
C520	86295	0.068 Mfd. 600 V. Paper	R519	82836	2,700 Ohms $\pm 10\%$ 2 W.
C521	87636	10 Mfd. 150 V. Lytic	R520	82431	3,900 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C522	86313	0.01 Mfd. 500 V. Ceramic	R521	82456	470,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C523	86313	0.01 Mfd. 500 V. Ceramic	R522	82617	47 Ohms $\pm 5\%$ $\frac{1}{2}$ W.
C525	86251	3000 Mmf. 500 V. Ceramic	R523	82617	47 Ohms $\pm 5\%$ $\frac{1}{2}$ W.
C526	86251	3000 Mmf. 500 V. Ceramic	R524	82437	12,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C527	86313	0.01 Mfd. 500 V. Ceramic	R525	82454	330,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C529	86248	0.15 Mfd. $\pm 10\%$ 200 V. Paper	R526	82451	180,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C530	86154	0.02 Mfd. 600 V. Paper	R527	82698	150,000 Ohms $\pm 5\%$ $\frac{1}{2}$ W.
C531	86255	2000 Mmf. 500 V. Ceramic	R528	82611	3,000 Ohms $\pm 5\%$ $\frac{1}{2}$ W.
C540	86253	360 Mmf. $\pm 10\%$ 500 V. Ceramic	R529	82998	270,000 Ohms $\pm 10\%$ 1 W.
C541	86252	1200 Mmf. $\pm 10\%$ 500 V. Ceramic	R530	82617	47 Ohms $\pm 5\%$ $\frac{1}{2}$ W.
C542	86253	360 Mmf. $\pm 10\%$ 500 V. Ceramic	R531	82460	1 Megohm $\pm 10\%$ $\frac{1}{2}$ W.
C543	86251	3000 Mmf. 500 V. Ceramic	R532	82442	33,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
C544	86030	0.05 Mfd. $\pm 10\%$ 400 V. Paper	R533	82424	1,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
CR501	400587	Selenium Rectifier	R534	82464	2.2 Megohm $\pm 10\%$ $\frac{1}{2}$ W.
CR502	309384	Silicon Rectifier	R535	82456	470,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
CR503	309384	Silicon Rectifier	R536	82440	22,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
CR504	309384	Silicon Rectifier	R537	82462	1.5 Megohm $\pm 10\%$ $\frac{1}{2}$ W.
F501	307556	Fuse 15 Amp.	R538	82462	1.5 Megohm $\pm 10\%$ $\frac{1}{2}$ W.
I 501	307572	Neon Lamp	R540	82409	56 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
J 502	307562	Chassis Connector Housing (Red, 9)	R541	82409	56 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
	941757	Contact	R542	82444	47,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
J 503	307563	Chassis Connector Housing (Yellow, 9)	R543	82610	6200 Ohms $\pm 5\%$ $\frac{1}{2}$ W.
	941757	Contact	R544	82456	470,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
J 504	307564	Chassis Connector Housing (Green, 9)	R545	82469	5.6 Megohms $\pm 10\%$ $\frac{1}{2}$ W.
	941757	Contact	R546	82640	27,000 Ohms $\pm 5\%$ $\frac{1}{2}$ W.
J 505	307561	Chassis Connector Housing (Blue, 6)	S 503	303481	Play Control Switch
	941757	Contact	T501	307587	Power Transformer
J 506	307565	Chassis Connector Housing (Blue, 12)	*T501	307588	Power Transformer
	941757	Contact	T540	303457	Pulse Transformer
J 507	306014	14-Connector Socket			
J 508	306014	14-Connector Socket	TB501	307650	Terminal Board (2 Terminals)
J 509	301034	6 Prong Socket (Small)	TB502	307567	Terminal Board Assembly
J 511	84315	Chassis Connector Housing (White, 9)	TB503	307568	Terminal Board Assembly
	941757	Contact			
J 512	307153	Chassis Connector Housing (White, 12)	V502	308003	2050 Thyatron
	941757	Contact	V503	308626	6X4 Vacuum Tube
J 513	301034	6 Prong Socket (Small)	V504	308003	2050 Thyatron
J 514	803722	Chassis Connector Housing (White, 3)	V540	308120	12AX7 Vacuum Tube
	941757	Contact			
J 540	303446	Single Prong Socket	VR501	308005	OA2 Voltage Regulator Tube
K501	303482	Play Control Add Solenoid Assembly	VR502	308005	OA2 Voltage Regulator Tube
K502	303484	Play Control Subtract Solenoid Assem.	Z501	303435	Pulse Amplifier Unit
K503	307590	Left Side Relay	Z502	303464	Play Control Assembly
K504	307592	Right Side Relay	Z503	303435	Pulse Amplifier Unit
L505	303603	130 μ h Choke $\pm 5\%$	XVR501	84295	7 Pin Miniature Socket
L506	303702	100 μ h Choke $\pm 5\%$	XVR502	84295	7 Pin Miniature Socket
L540	303602	16 μ h Choke $\pm 5\%$	XV502	84292	Octal Socket
L541	303602	16 μ h Choke $\pm 5\%$	XV503	84295	7 Pin Miniature Socket
L542	303600	11 μ h Choke $\pm 5\%$	XV504	84292	Octal Socket
L543	303600	11 μ h Choke $\pm 5\%$	XV540	84304	9 Pin Miniature Socket

* Components used for 50 cycle operation only.

TRANSISTORIZED AUTO-SPEED UNIT, Type 45TASU1

DRAWING NO. 307627

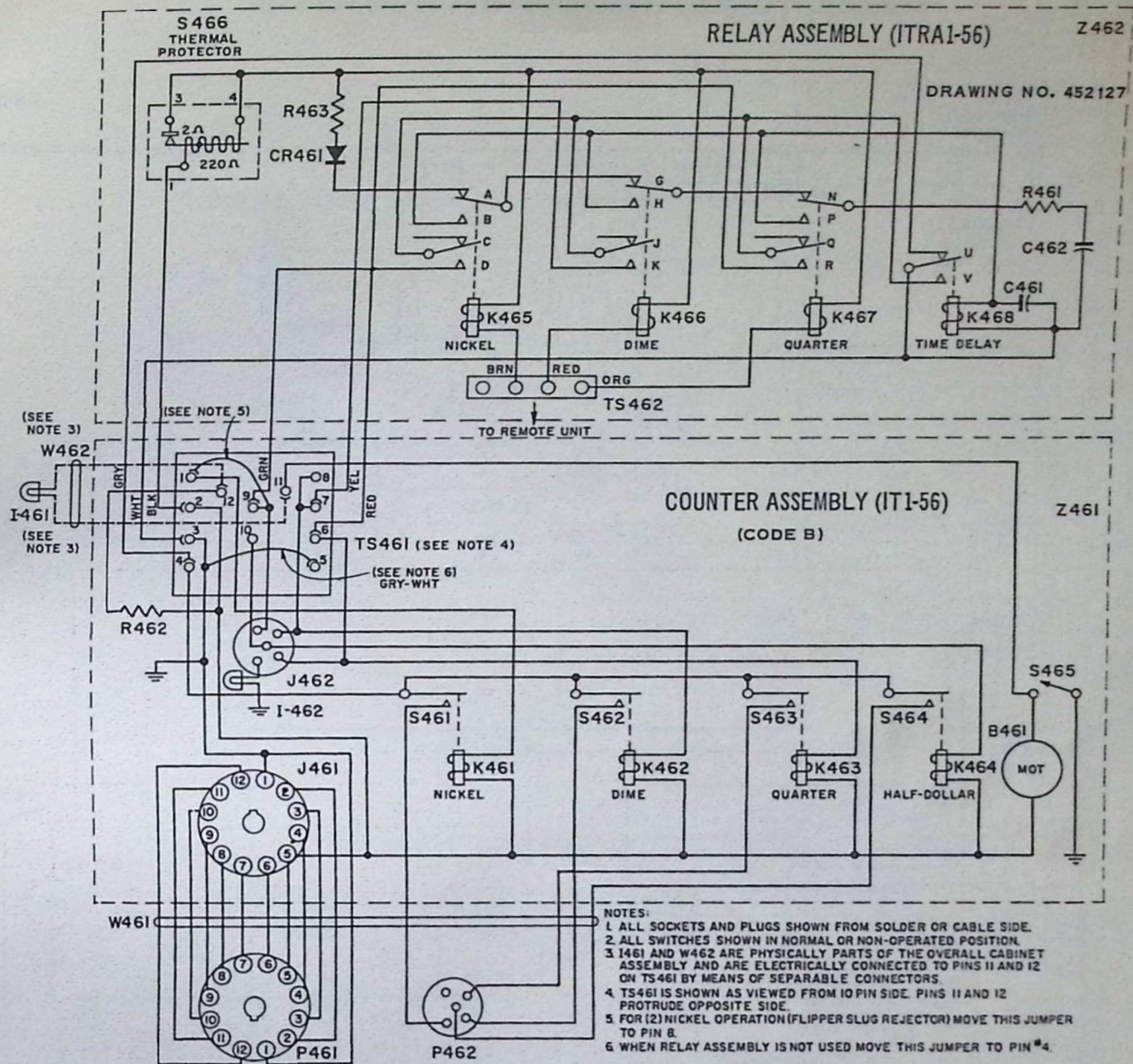
- NOTES:
1. ALL RECEPTACLES ARE VIEWED FROM CABLE END.
2. FOR 50 CYCLE UNITS, TYPE 45 TASU1-5, USE ALTERNATE COMPONENTS MARKED WITH ASTERISK.



Item	Part No.	Description	Item	Part No.	Description
-	307600	45TASU1 Transistorized Auto-Speed Unit	†	84312	Power Transistor Socket
C751	86348	4 mfd 370 V.A.C. Oil Filled Paper	†	375074	Mica Insulator
C752	87725	1000 mfd 30V. Lytic	†	53015	Silicone Grease (2 oz. tube)
C753	86356	2 mfd 200V. Mylar	R751	81226	1000 ohm W.W. 5W. 10%
C754	86235	0.05 mfd 200V. Paper	R752	81225	27 ohm W.W. 5W. 10%
CR751	309387	Silicon Rectifier (200 PIV)	R753	81231	0.75 ohm W.W. 5 W. 10%
CR752			R754	307625	4 ohm W.W. Potentiometer
CR753			T751	307615	Power Transformer
CR754			* T751	307616	Power Transformer
K751	307623	Power Relay (60 cps)	T752	307621	Control Transformer
* K751	307624	Power Relay (50 cps)	* T752	307622	Control Transformer
L751	307619	Choke	T753	307617	Output Transformer
† Q751	309422	GC-433 Transistor	* T753	307618	Output Transformer
† Q752	309422	GC-433 Transistor	W751	307638	Power Plug & Cable Assembly

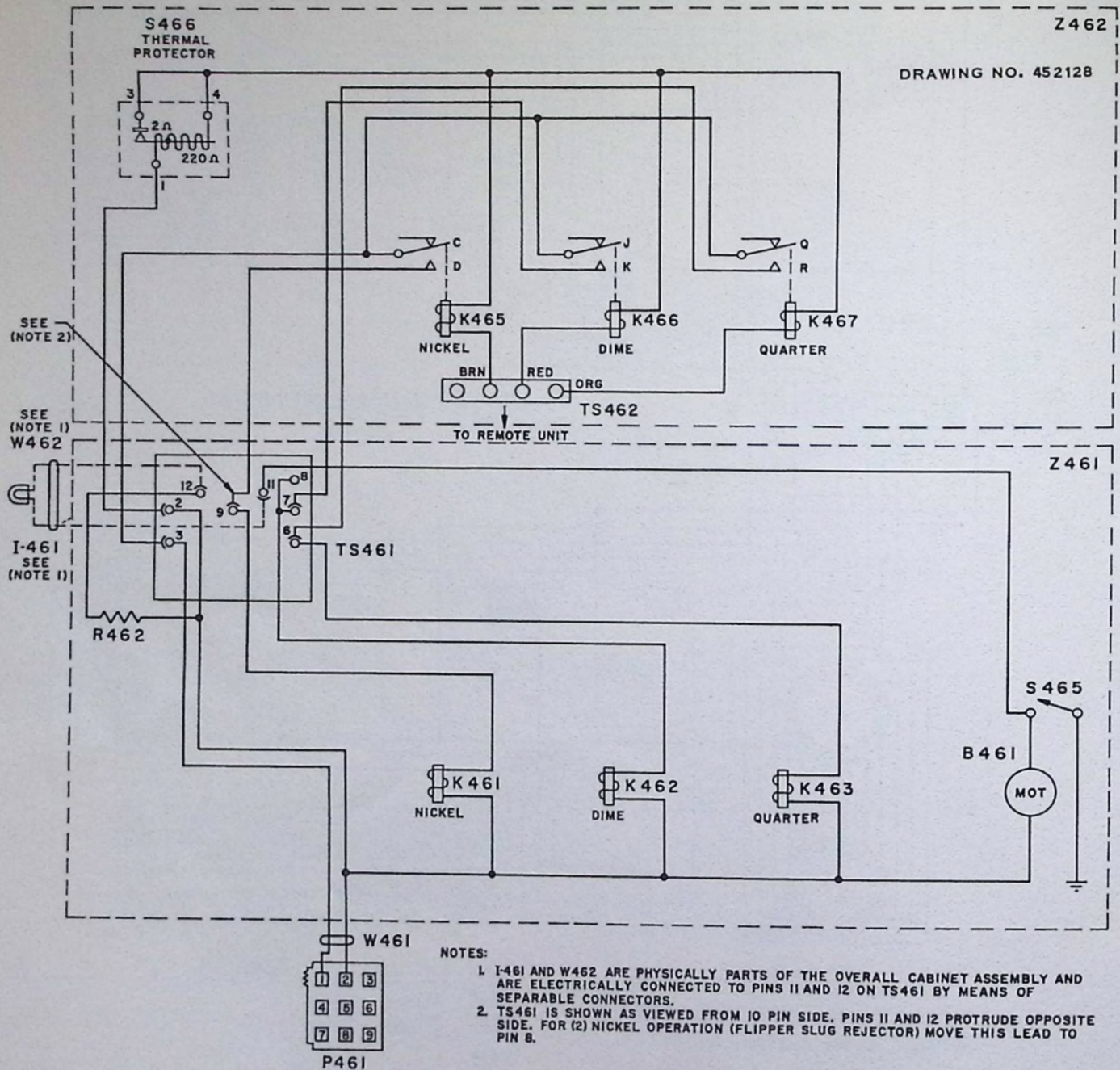
† USE MICA INSULATOR COATED WITH LIBERAL AMOUNT OF SILICONE GREASE ON BOTH SIDES WHEN MOUNTING POWER TRANSISTORS.

INCOME TOTALIZER, Types IT1-56, IT1R-56 and IT11R-56



Item	Part No.	Description	Item	Part No.	Description
-	452000	Income Totalizer, Type IT1R-56	K467	452154	Relay
-	451002	Income Totalizer, Type IT1-56	K468	452155	Relay
B461	452116	Motor & Gear Reduction Assem.	P461 } (Included in W461)		
C461	87695	100 Mfd 50 V. Electrolytic	P462 }		
C462	87695	100 Mfd 50 V. Electrolytic	R461	82403	Resistor 18 Ohm ½ W.
CR461	309387	Rectifier	R462	81178	Resistor 65 Ohm 10 W.
I461	487788	No. 57 Panel Lamp	R463	82408	Resistor 47 Ohm ½ W.
I462	452386	No. 93 Lamp	S461 } 452102		Switch Assembly
J461	201275	Socket 12 Contact	S462 }		
J462	450735	Socket 5 Contact	S463 }		
K461	452038	Solenoid Coil Nickel	S464 }		
K462	452039	Solenoid Coil Dime	S465	452070	Switch
K463	452040	Solenoid Coil Quarter	S466	452194	Thermal Cutout
K464	452041	Solenoid Coil Half - Dollar	TS461	452119	Terminal Board Assembly
K465	452154	Relay	TS462	452147	Terminal Strip
K466	452154	Relay	W461	452149	Cable Assembly
			W462	487779	Totalizer Aux. Light Cable Assem.

INCOME TOTALIZER, Types IT1-56, IT1R-56 and IT11R-56

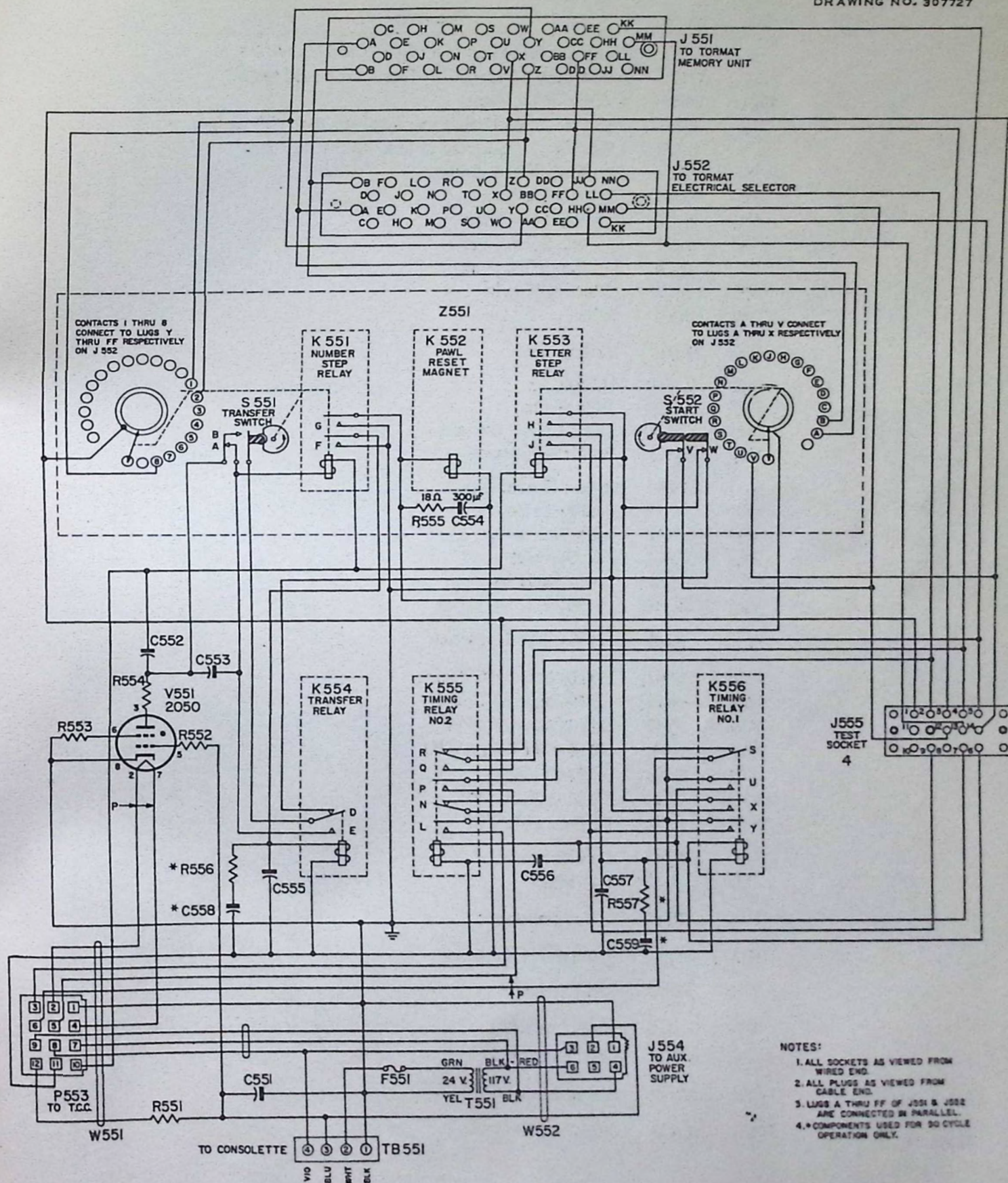


Schematic for IT11R-56 Only.

Item	Part No.	Description	Item	Part No.	Description
-	452020	Income Totalizer, Type IT11R-56	P461	451462 941757	Housing Contact
B461	452116	Motor & Gear Reduction Assembly	R462	81178	Resistor 65 Ohm, 10 W.
I 461	487788	No. 57 Panel Lamp	S465	452070	Switch
K461	452038	Solenoid Coil Nickel	S466	452194	Thermal Cutout
K462	452039	Solenoid Coil Dime	TS461	452119	Terminal Board Assembly
K463	452040	Solenoid Coil Quarter	TS462	452147	Terminal Strip
K465	452154	Relay	W461	452189	Cable Assembly
K466	452154	Relay	W462	487779	Totalizer Auxiliary Light Cable Assem.
K467	452154	Relay			

REMOTE CONTROL STEPPER UNIT, Type RCSU4

DRAWING NO. 307727



NOTES:

1. ALL SOCKETS AS VIEWED FROM WIRED END.
2. ALL PLUGS AS VIEWED FROM CABLE END.
3. LUGS A THRU FF OF J 551 & J 552 ARE CONNECTED IN PARALLEL.
4. *COMPONENTS USED FOR 50 CYCLE OPERATION ONLY.

Schematic Diagram, Type RCSU4

16057

REMOTE CONTROL STEPPER UNIT, Type RCSU4

Item	Part No.	Description
—	307700	Remote Control Stepper Unit, Type RCSU4 (60 cycles)
—	307701	Remote Control Stepper Unit, Type RCSU4-5 (50 cycles)
C551	86235	0.05 Mfd. 200 V. Paper
C552	86357	5 Mfd. 165 V. Oil Filled Paper (used on Code "C" Units)
	86320	5 Mfd. 300 V. Paper (used on Code "A" & "B" Units)
C553	86250	5000 Mmfd. 1000 V. Ceramic
C554	87611	300 Mfd. 50 V. Lytic
C555	86235	0.05 Mfd. 200 V. Paper
C556	86235	0.05 Mfd. 200 V. Paper
C557	86235	0.05 Mfd. 200 V. Paper
*C558	87571	25 Mfd. 50 V. Lytic
*C559	87571	25 Mfd. 50 V. Lytic
F551	303713	3.2 Amp. Fuse
J551	411557	34 Prong Socket
J552	304962	34 Prong Plug
J554	305632	6 Ckt. Chassis Connector
J555	306014	Socket 14 Connector
K551	303940	Number Step Relay
K552	303944	Pawl Reset Magnet
K553	303941	Letter Step Relay
K554	303074	Transfer Relay
K555	303764	Timing Relay No. 2
K556	307732	Timing Relay No. 1
P553	305925	12 Ckt. Cable Connector
R551	82448	100,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
R552	82436	10,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
R553	82440	22,000 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
R554	81246	100 Ohms W. W. $\pm 10\%$ 2 W.
R555	82403	18 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
*R556	82412	100 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
*R557	82412	100 Ohms $\pm 10\%$ $\frac{1}{2}$ W.
S551	303547	Transfer Switch
S552	303794	Start Switch
T551	307074	24 V. Transformer
TB551	503607	Terminal Board Assembly
V551	308003	2050 Thyatron
W551	307713	Cable Assembly
W552	307718	Cable Assembly
Z551	307720	Stepper Assembly
XV551	84292	Octal Socket

* COMPONENTS USED FOR 50 CPS OPERATION ONLY.

SUBTRACT PAWL AND GUIDE PLATE:

POSITION NO. 1

- Advance Credit Wheel so detent lever is engaged with tooth No. 6.
- Loosen two screws on subtract pawl guide plate.
- Position guide plate so, when subtract solenoid operates, the subtract pawl enters tooth No. 13 without striking the sides of the tooth.
- Tighten screws on guide plate.



POSITION NO. 2

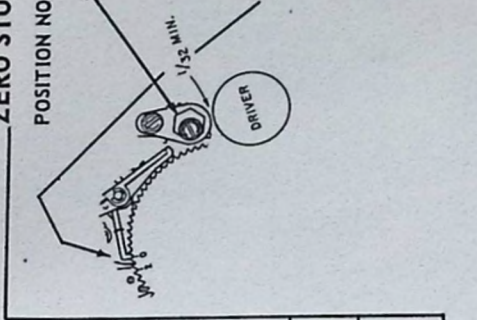
- Advance Credit Wheel so detent lever is engaged with tooth No. 6.
- Loosen two screws on subtract pawl guide plate.
- Position guide plate so, when subtract solenoid operates, the subtract pawl enters tooth No. 12 without striking the sides of the tooth.
- Tighten screws on guide plate.



ZERO STOP:

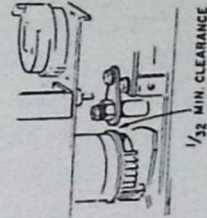
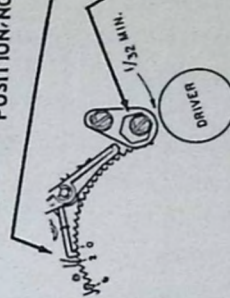
POSITION NO. 1

- Remove lock plate. Loosen screw on zero credit stop and rotate stop so the long radius of the eccentric post is facing away from the Credit Wheel. See Note 1.
- Engage detent lever with No. 0 tooth on Credit Wheel.
- Bias the wheel against the stop.
- Adjust stop position so there is slight clearance between the tip of the detent lever and the face of the No. 0 tooth.
- Replace lock plate and tighten screws.



POSITION/NO. 2

- Engage detent lever with No. 1 tooth on Credit Wheel.
- Remove lock plate. Loosen screw on zero credit stop and rotate stop so the long radius of the eccentric post is facing the Credit Wheel. See Note 1.
- Bias the wheel against the stop.
- Adjust stop position so there is slight clearance between the tip of the detent lever and the face of the No. 1 tooth.
- Replace lock plate and tighten screws.

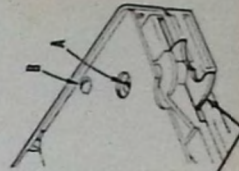


NOTE 1: Make CERTAIN that positioning of eccentric post is such that a minimum clearance of 1/32 inch exists between outer edge of Album Credit "driver" and Lock Plate.

SLUG REJECTOR:

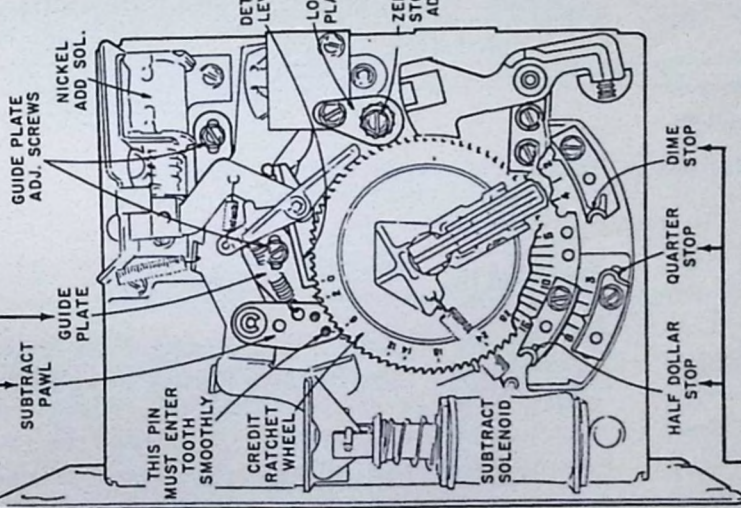
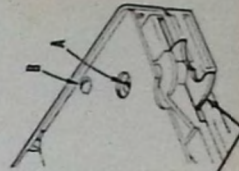
POSITION NO. 1

- LONG SCREW AT A
- SHORT SCREW AT B



POSITION NO. 2

- LONG SCREW AT B
- SHORT SCREW AT A

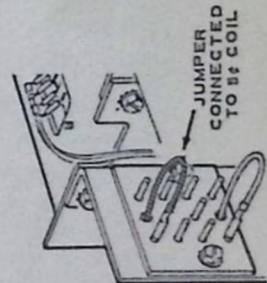


ADD STOPS POSITION
CREDITS FOR COINS ARE DETERMINED BY POSITIONING STOPS.

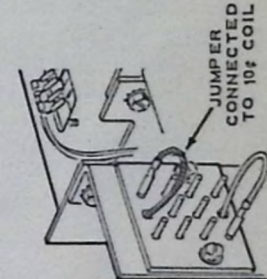
- Remove screw from stop.
- Shift stop to desired position using pointer on stop as indicator.
- Replace and tighten screw.

INCOME TOTALIZER JUMPER

POSITION NO. 1

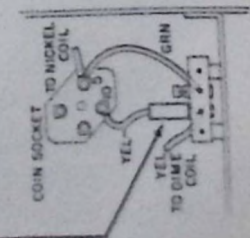


POSITION NO. 2

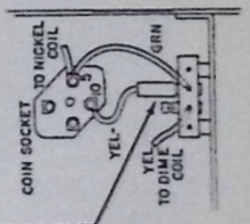


ALBUM PRICING UNIT JUMPER

POSITION NO. 1



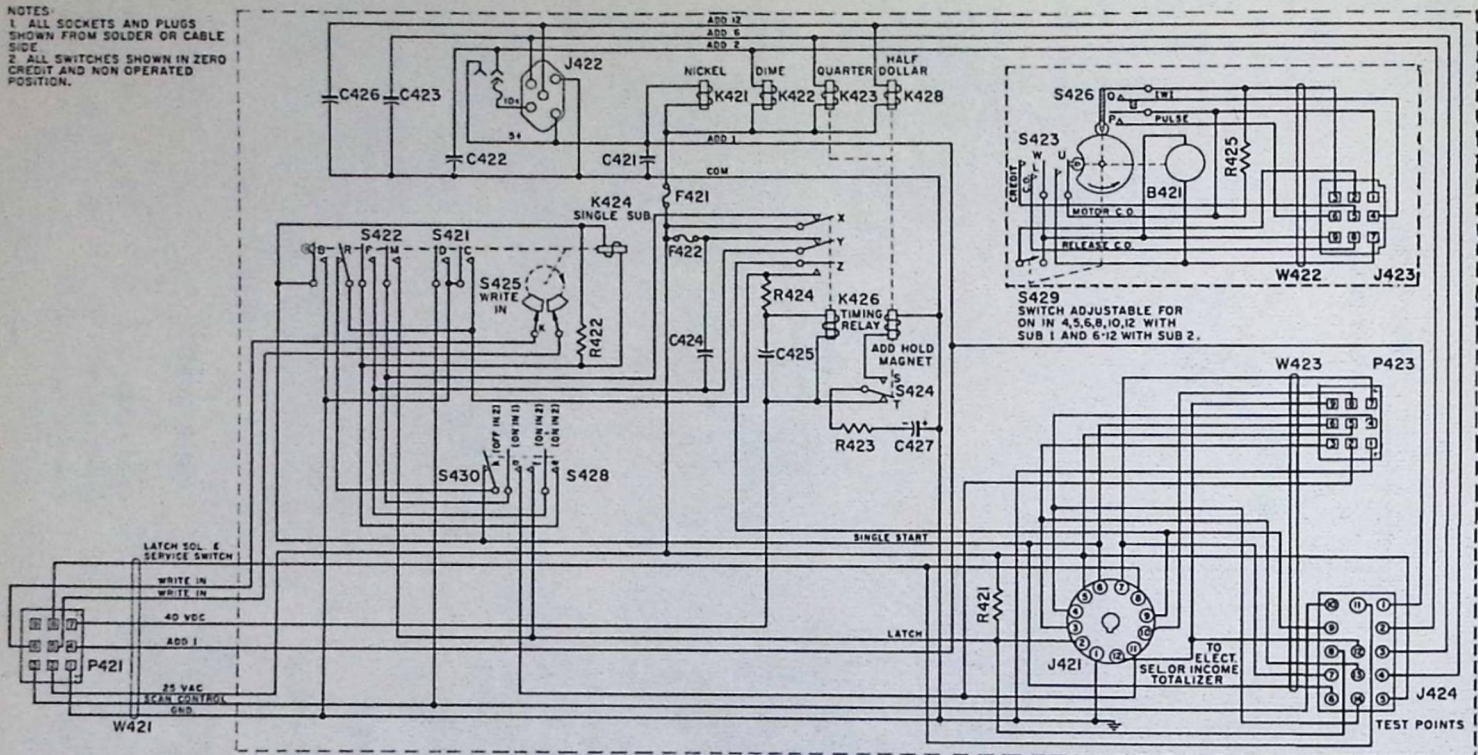
POSITION NO. 2



ALBUM PRICING UNIT, Type APU1

DRAWING NO. 451492

NOTES:
1. ALL SOCKETS AND PLUGS SHOWN FROM SOLDER OR CABLE SIDE.
2. ALL SWITCHES SHOWN IN ZERO CREDIT AND NON OPERATED POSITION.



Schematic Diagram for Album Pricing Unit, Type APU1. (Code B)

Item	Part No.	Description	Item	Part No.	Description
-	451400	Album Pricing Unit, Type APU1	P421	451462	Cable Connector Housing, 9 Pin, Green
B421	451461	Motor	P423	233409	Cable Connector Housing, 9 Pin, White
C421	86259	0.02 mfd, Ceramic	R421	82707	Resistor, 1.2 K, 1 W.
C422	86259	0.02 mfd, Ceramic	R422	82838	Resistor, 100 ohm, 2 W.
C423	86259	0.02 mfd, Ceramic	R423	82403	Resistor, 18 ohm, 1/2 W.
C424	86259	0.02 mfd, Ceramic	R424	82868	Resistor, 150 ohm, 1 W.
C425	86142	0.1 mfd, 200 V	R425	82442	Resistor, 33 K, 1/2 W.
C426	86258	0.04 mfd, Ceramic	S421	451204	Switch (Timing Relay)
C427	87695	100 mfd, 50 V, Electrolytic	S422	451115	Switch (Carry-Over)
F421	503636	Fuse, 1/2 Amp, Slo Blo	S423	451466	Motor Carry-Over Switch
F422	451248	Fuse, 1-6/10 Amp, Slo Blo	S424	451141	Switch (Condenser)
J421	201275	Socket, 12 Contact	S425	451098	Write-In Switch
J422	450735	Socket, 5 Contact	S426	451467	Pulse Switch
J423	84315	Chassis Connector Housing, 9Pin, White	S428	451456	Credit Circuit Switch
J424	306014	14 Pin Connector Socket	S429	451464	Credit Switch
K421	451068	Solenoid Assembly (Nickel)	S430	451602	Cancel Circuit Switch
K422	451068	Solenoid Assembly (Dime)	W421	451504	Control Cable
K423	451068	Solenoid Assembly (Quarter)	W422	451506	Motor Cable
K424	451094	Solenoid Assembly (Cancel)	W423	451508	Supply & Test Cable Assembly
K426	451228	Timing Relay			
K427	451234	Hold Magnet Assembly			
K428	451218	Solenoid Assembly (Half Dollar)			

SEEBURG

STEREO CONSOLETTTE, Type SC1

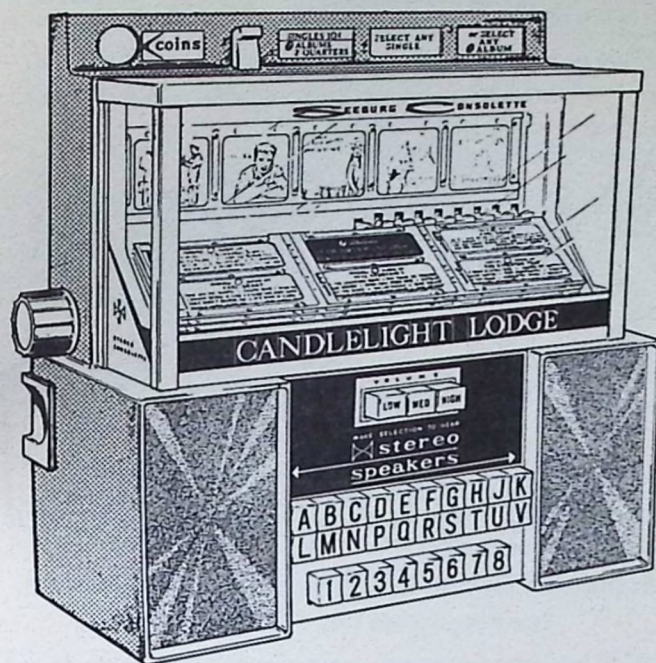


Figure 1. Exterior View.

The Seeburg Stereo Consolette, Type SC1, is a unit of the Seeburg wired remote control system designed for the remote choice of "Album" or "Single" play selections in the Select-O-Matic phonograph. The Consolette is equipped with a pair of speakers - Right Channel and Left Channel - which provide for localized listening to selections. Speaker volume may be controlled at the Consolette by push buttons marked LOW, MEDIUM and HIGH. When a selection is made at the Consolette, circuits are completed through the phonograph which permit listening to the program through the Consolette stereo speakers. The speakers continue operation until the phonograph mechanism comes to rest and are then silent until a selection is again made at the Consolette.

The Consolette operates in conjunction with the selection and audio systems in the LPC model phonograph. The Consolette is connected to the phonograph with a 10-conductor color-coded cable.

The pricing structure of the Stereo Consolette, Type SC1, is initially set up at the factory: one album for 2 quarters, three single plays for one quarter, or one play for a dime or two nickels.

The Consolette is equipped with a Type APU10-56, Album Pricing Unit, which provides extreme flexibility in setting up different pricing combinations as detailed on pages 6 & 7. The slug rejector is designed to accept quarters, dimes and nickels. Each coin operates a coin switch to establish credit for the selection of a play at the Consolette. At the same time, the credit unit in the Consolette transmits the total credits accepted to the Type IT1R-56, Income Totalizer in the phonograph which indicates total cash deposited.

When the phonograph main switch is turned on, credit lights in the Consolette go on immediately after minimum credit has been established, i.e., two nickels or a dime have been deposited. The credit lights stay on as long as there remain unspent credits.

The Consolette mechanism operates at 24 volts A.C., 60 cycles. Power is supplied by the RCSU4, Remote Control Stepper Unit, for up to 6 Stereo Consolettes. If the installation requires more than 6 Consolettes, an Auxiliary Power Supply, Type RPS6-56, must be used for each additional group of 6 Consolettes.

The black and white wires of the interconnecting cable carry power to the lights and motor. The blue and black wires comprise a selection circuit to provide remote control of the selection system operation in the phonograph. The brown, red, and orange wires are for transmittal of coin deposit information to the income totalizer in the phonograph and their terminal board is covered and sealed as shown in Figure 2. The balance of wires in the cable are for audio and control of the stereo speakers in the Consolette.

Bar Bracket Assembly, Seeburg Part No. 500225, is available for rigidly mounting the Consolette on bars, counters and tables.

The Stereo Consolette has been thoroughly tested before leaving the factory. Unless damaged in shipment, no adjustments to the Consolette are necessary.

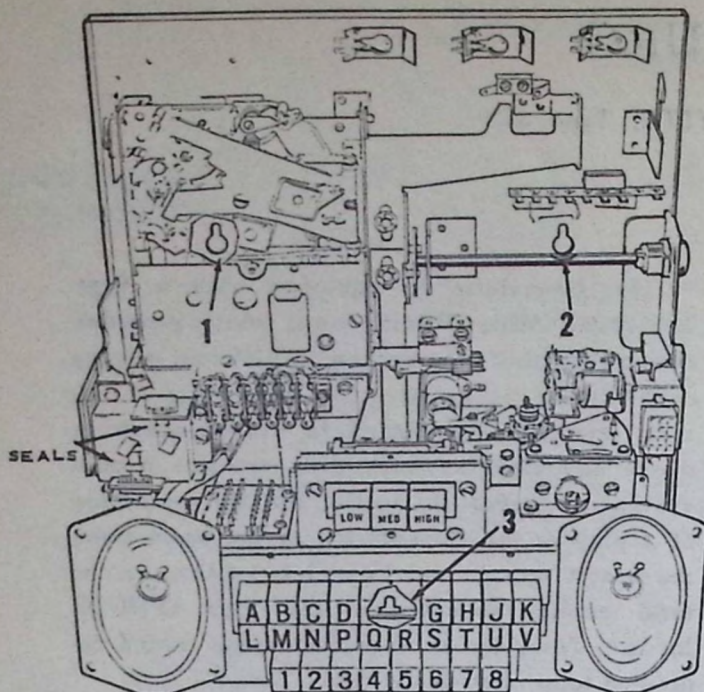


Figure 2. Interior View - Mounting and Seals.

STEREO CONSOLETTTE INSTALLATION

Mounting the Consolette

There are three holes in the back plate for mounting, identified 1, 2 and 3 in Figure 2. The two upper holes are slotted for fitting over screws already set in the wall at the proper points. The lower hole is for rigidly mounting the Consolette by means of a screw, after it has been hung in place.

If the mounting place on the wall is uneven, the Consolette mounting plate should be shimmed with cardboard or wood before tightening the three mounting screws. Tightening the mounting screws on an uneven wall will bend the mounting plate, which may seriously affect the operation of the Consolette and may cause the cover and lock to bind.

To gain access to the mounting holes in the Consolette's back plate, proceed as follows:

1. Unlock the Consolette and slide off the housing.
2. Remove the program holder by raising the two latches at the top of the program holder and lifting it up and out of the Consolette.
3. Remove the slug rejector by lifting it up and out.

Wiring the Consolette

Use 10-conductor interconnecting cable, Seeburg Part No. 507503, to connect the Consolette to the phonograph. This cable can be purchased in bulk and cut to the correct length for each installation. It is recommended that the

left hand speaker be disconnected and removed from the Consolette to prevent damage to the speaker during wiring. To wire the Consolette, proceed as follows: (See Figures 3 and 4)

1. Remove the cash box. Disconnect and remove left speaker. Remove the bottom hole cover and the cable channel. Remove the terminal board cover from the left hand terminal board.

NOTE: Later models have the above underlined items packaged in plastic bag inside of cash box. (See Page 12125 for Installation.)

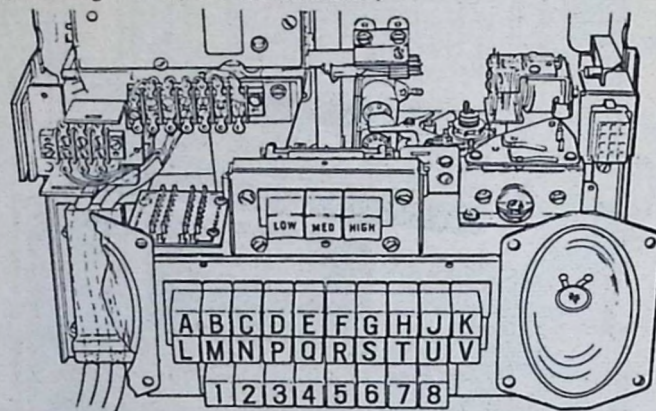


Figure 3. Terminal Boards - Wiring Connections.

2. Feed the interconnecting cable, Seeburg Part No. 507503, through the bottom hole cover and solder on spade lugs, Part No. 940592. Feed the brown, red and orange leads to the lower terminals on the left hand terminal board and carefully dress leads through slot in the mounting bracket so that leads will not be shorted when terminal board cover is installed.

CAUTION: Push spade lugs all the way on to screw to insure clearance when cover is installed.

Connect each lead to the color coded terminal that matches the color of the lead.

3. Feed the black, white, grey, violet, blue, green and yellow leads behind the right hand terminal board and up around the board to the top terminals. Limit wire dressing slack to avoid interference with the bottom of slug rejector to insure proper operation. Connect each lead to the color coded terminal that matches the color of the lead.

CAUTION: Color code matching must be strictly observed.

4. Replace the cover on the left hand terminal board; secure with two screws. Install one of the seals from the lower left side of the terminal board cover so that the serial number is right reading and fold the tab down at the score mark. Install the other seal from the upper right side of the terminal board cover and fold the tab up at the score mark. (See Figure 2).

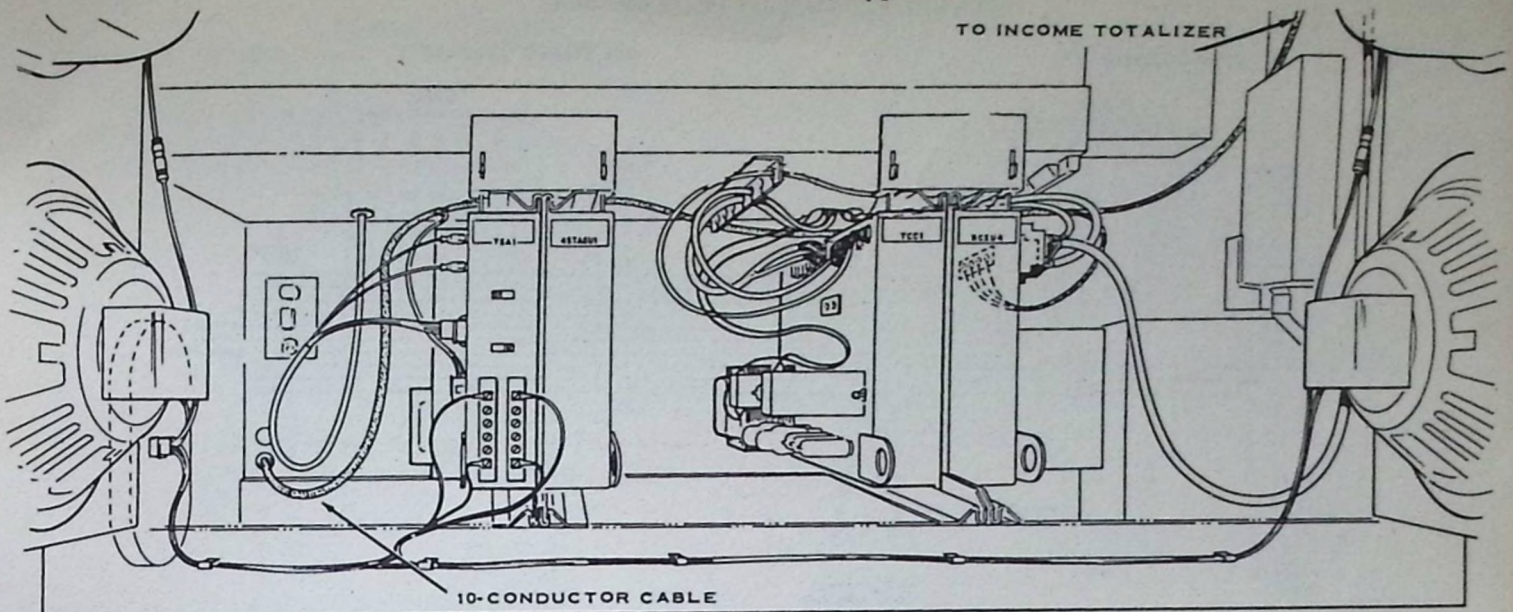


Figure 4. Phonograph Wiring Diagram - Cable Installation in Phonograph.

5. Install the cable channel over the cable and secure it with the top two screws. Position the bottom hole cover and secure both the bottom hole cover and the cable channel with the two lower screws.
6. Position the left hand speaker; secure with two screws from above the mounting bracket. Reconnect the left hand speaker by pushing-on its taper tabs. Note that tabs are different in size and must match connector on speaker to insure proper phasing.
7. Install the cash box, slug rejector and program holder.

Phonograph Wiring

Feed the 10-conductor cable through the hole (located in the lower left hand corner when facing the phonograph). Remove the Masonite plate covering the hole and feed the cable through the grommet. Dress the cable in the phonograph as shown in Figure 4.

Referring to system wiring diagram, Figure 6, connect the violet, blue, white and black leads of the 10-conductor cable to the matching color coded terminals on the terminal board in the Remote Control Stepper Unit, Type RCSU4. Solder one spade lug, Seeburg Part No. 940592 to each of these leads. Be sure the colors of the leads match the colors called for on the terminal board.

Connect the yellow, grey and green leads to the terminal block on the Transistorized Stereo Amplifier, Type TSA1. Strip the end of each lead,

slip it in the proper color coded hole and tighten the terminal screw to secure the lead as shown in Figures 5a and 5b.

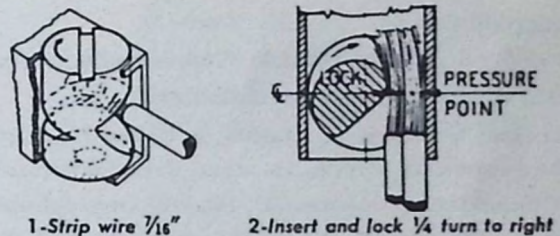


Figure 5a. Stripping and Locking Wire.

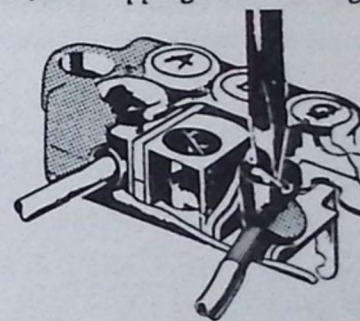


Figure 5b. Perspective Showing Application.

Connect the brown, red and orange leads to the terminal strip on the Income Totalizer, Type IT1R-56. Solder one spade lug, Part No. 940592, to each of these leads and connect them to the proper color coded terminals.

NOTE: The phonograph is capable of supplying power for six Stereo Consolettes. If the installation requires more than six Consolettes, an Auxiliary Power Supply, Type No. RPS6-56, must be added to the Remote Control Stepper Unit for each additional six Consolettes. Connect the remaining leads from these Consolettes in the same way as the first six Consolettes.

STEREO CONSOLETTTE, Type SC1

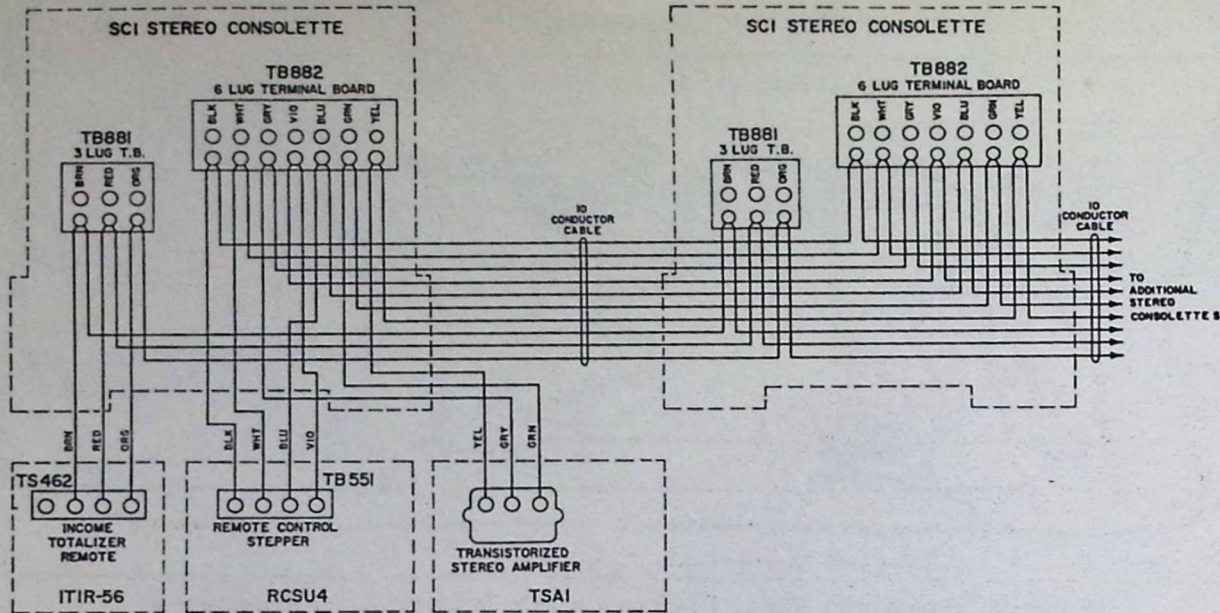


Figure 6. System Wiring Diagram.

Phonograph Wiring

(Used on LPC1R Model Phonographs above Serial No. 112980 (approximately))

On later model phonographs, a 10-Station Cam Action Terminal Block is used for connecting the 10-conductor cable to the phonograph as shown in Figure 7. Internal cabling from the Terminal Block to the various electronic components in the phonograph is factory installed.

Stripping and locking of 10-conductor cable wire is the same as illustrated in Figures 5a and 5b. A system wiring diagram using the 10-Station Cam Action Terminal Block is shown in Figure 8.

NOTE: For application of Cover Seal, refer to section titled "Stereo Consolette Installation"; Page 12118, step 4.

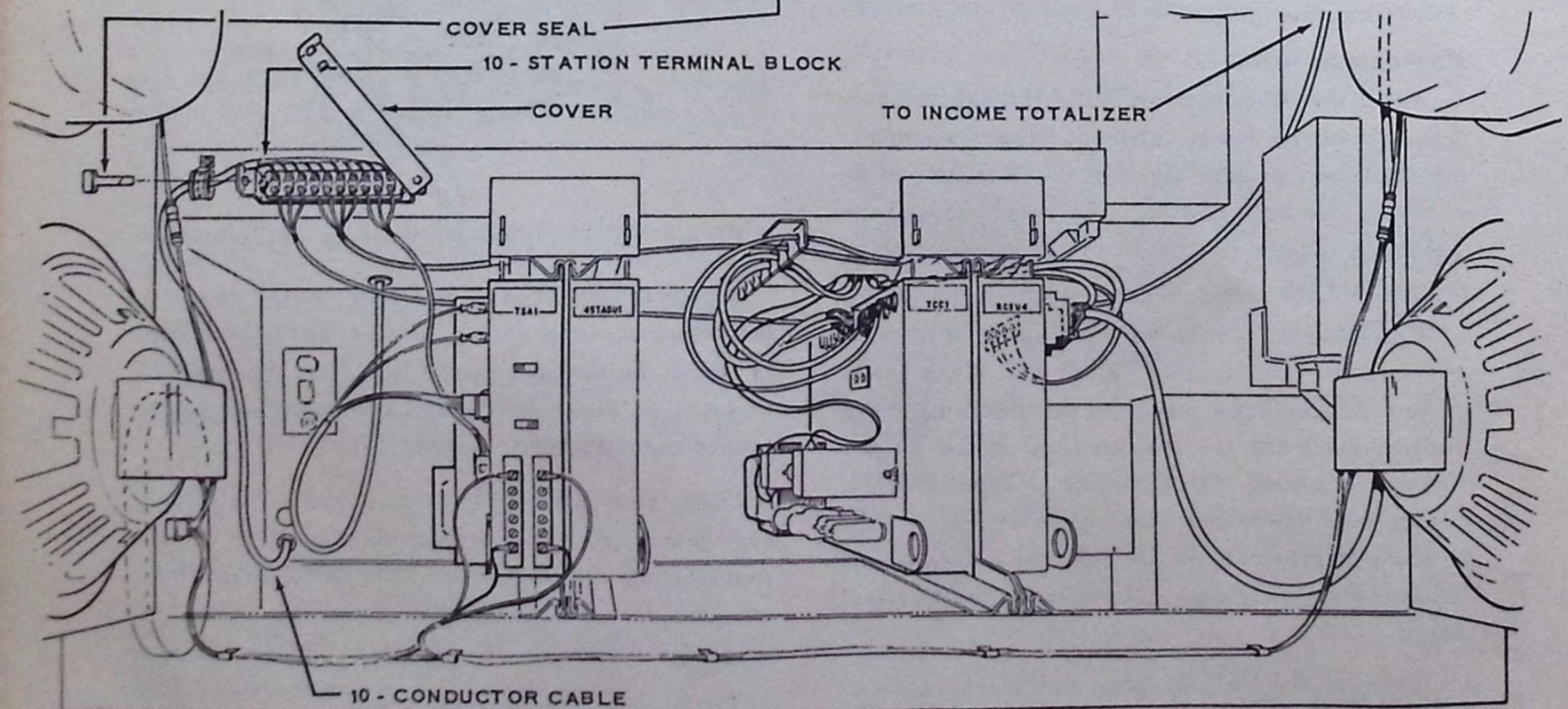


Figure 7. Phonograph Wiring Diagram - Cable Installation in Phonograph.

STEREO CONSOLETTTE, Type SC1

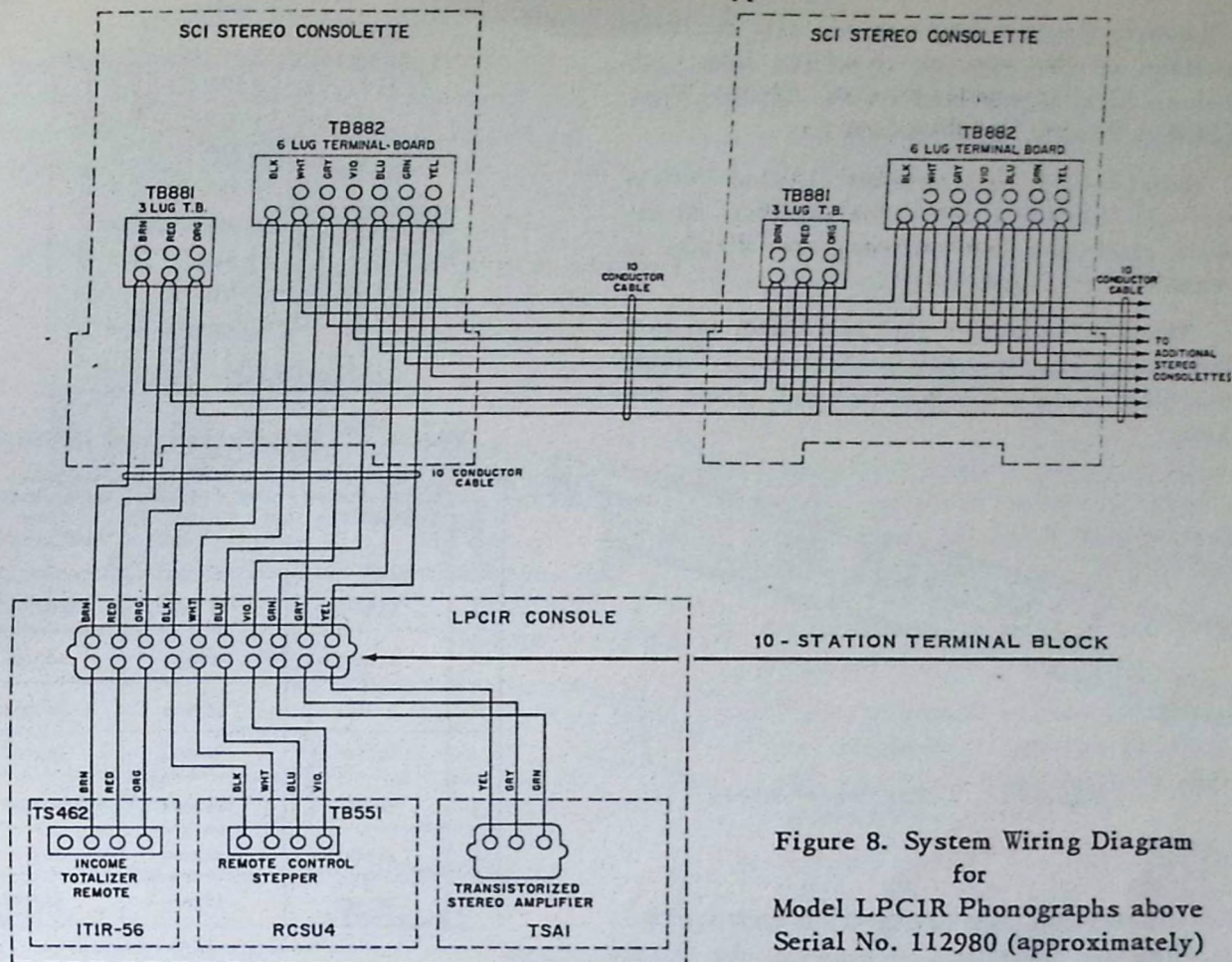


Figure 8. System Wiring Diagram for Model LPC1R Phonographs above Serial No. 112980 (approximately)

PROGRAM HOLDER INSTALLATION

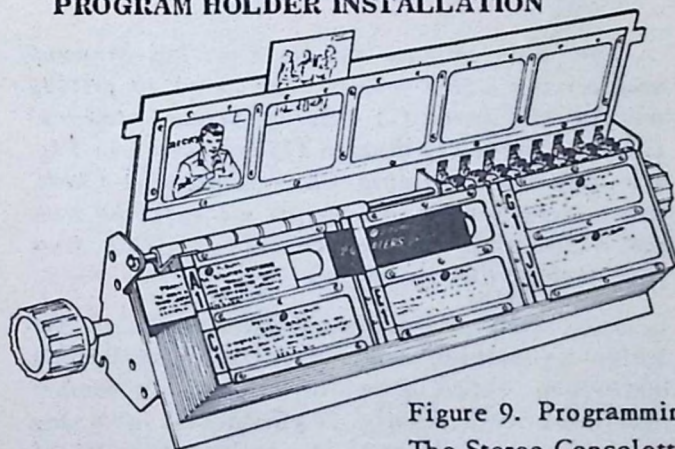


Figure 9. Programming The Stereo Consolette.

Lithographed LP miniature facsimiles of the album record jacket are supplied for the Consolette in the Albums of the Month Record Package. Unlatch and remove the program holder from Consolette. Slide five album facsimiles in the upper plate of the program holder from the top. Slide five album facsimiles in the lower plate of the program holder from the bottom.

Slide five title strips in each side of the eight program leaves, slide each strip in from the left side of the program leaf. Be sure the "letter-number" codes on each title in the Consolette

match the "letter-number" code for that title in the phonograph. Slide the album pricing card or single pricing card in the upper center slot on every program leaf, Figure 9.

Install the program holder in the Consolette and secure firmly with two latches.

PERSONALIZED LOCATION DISPLAY INSTALLATION

The Stereo Consolette features a display panel which may be used to identify the location. The display holder is secured inside the housing by two spring clips which hold it against the glass. Lift the display holder upward to remove. Hold spring clips open if necessary (see Figure 10).

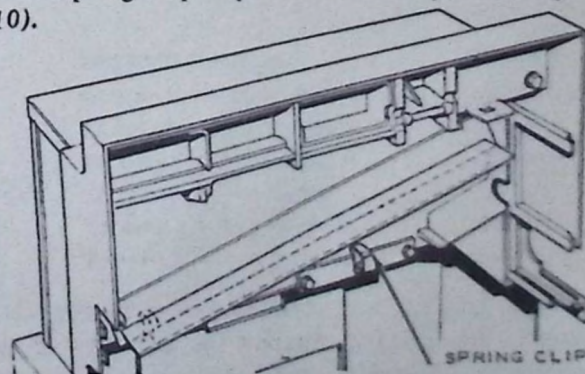


Figure 10. Removing Display Holder.

STEREO CONSOLETTTE, Type SC1

Letters, numbers and spacers, etc. required to make up the sign are available from your Seeburg distributor under Part No. 509088, Type RACK-1, Remote Alphabet Case Kit.

Slide letters into position, making certain that all characters are close together, on the same plane and that the completed display is centered (see Figure 11).

When the display holder is loaded, press it into the spring clips inside the housing. Install the housing on the Consolette and secure with lock.

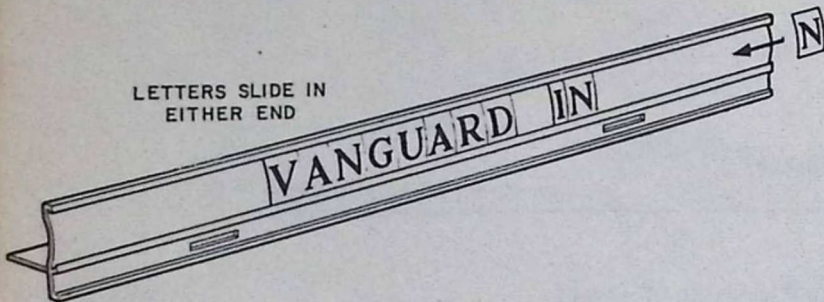


Figure 11. Letter Installation.

PROGRAMMING THE STEREO CONSOLETTTE

When the Consolette is shipped, the pricing mechanism is permanently wired for "Albums" in group 1 and 2. "Singles" are set up in groups 3 through 8. Albums are priced to play for 2 quarters. Single records are priced to play for ten cents or three for a quarter.

In order to change the album grouping or to provide additional groups of albums, shift the two (2) leads which correspond to the particular group to be changed, from the "Singles" terminals to the "Albums" terminals, or vice versa to change from "Albums" to "Singles" grouping as shown in Figure 12. It is recommended that "Albums" grouping changes be made in numerical order. Number Strip Cards in the program holder should be changed at the time when "Album" grouping is changed. The cards are available from your Seeburg Distributor and are listed below.

PART NO.	ALBUM GROUPING
507701	NUMBER STRIP CARD A3
507702	NUMBER STRIP CARD A4
507703	NUMBER STRIP CARD A5
507704	NUMBER STRIP CARD A6
507705	NUMBER STRIP CARD A7
507706	NUMBER STRIP CARD A8

When pricing combinations are to be modified, change the Pricing Window in the top of the Consolette housing and change the Pricing Cards in the program holders.

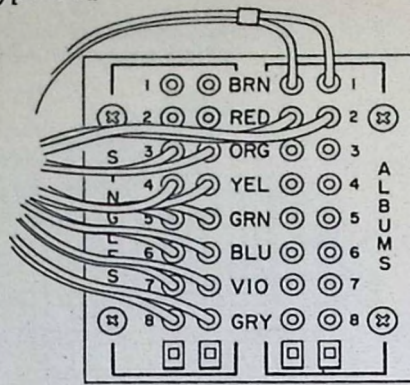


Figure 12. Pricing Terminal Board.

Number	PRICING WINDOW PART NUMBER	SINGLE PRICING CARD PART NUMBER	ALBUM PRICING CARD PART NUMBER
1	*507457	*507508	*507506
2	507660	507508	507686
3	507457	507683	507506
4	507660	507683	507686
5	507661	507684	507686
6	507457	507685	507506
7	507660	507685	507686

* SUPPLIED WITH STEREO CONSOLETTTE.

Figure 13. Pricing Windows and Cards.

The table, Figure 13, lists pricing windows and pricing cards which correspond to pricing windows for seven (7) different pricing combinations numbered (1) through (7) and listed in Figure 18, Album Pricing Unit Adjustment Chart. Items identified by an asterisk are supplied with the Consolette. All others are available from your Seeburg distributor.

For complete Album Programming of the Stereo Consolette, refer to Album Programming Instruction Sheet, Part No. 507715. It further illustrates and details requirements involving the adjustments of the APU10 and associated application of pricing cards and windows.

Refer to the phonograph instruction manual for the procedure for making corresponding pricing changes in the phonograph. Be sure the phonograph and each Consolette are set to play the same selection with the choice of the same "letter-number" group.

Pricing Window Kit (Quarter Only), Part No. 509150, makes it possible to set up the slug rejector for quarter play only. Nickels and dimes deposited are automatically returned. A new Pricing Window and "Singles" Pricing Card is included.

STEREO CONSOLETTTE, Type SC1

PRICING CHANGE ADJUSTMENTS

The Album Pricing Unit, Type APU10-56 is designed for use in the Stereo Consolette. It exemplifies high versatility in credit units and is capable of extreme flexibility in setting up pricing combinations and Album Programming. A chart, *Figure 18*, condenses information regarding the setup requirements for seven (7) popular pricing combinations.

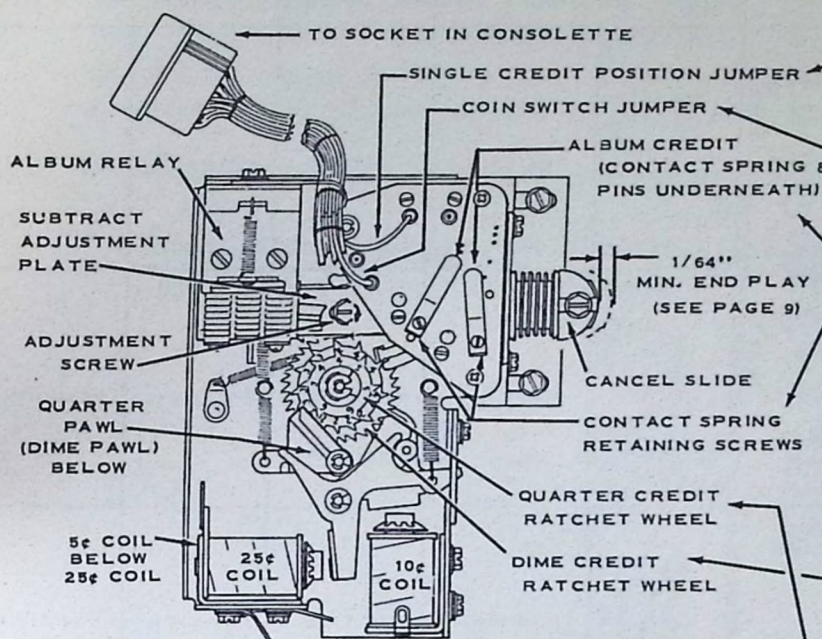


Figure 14. Album Pricing Unit, APU10-56

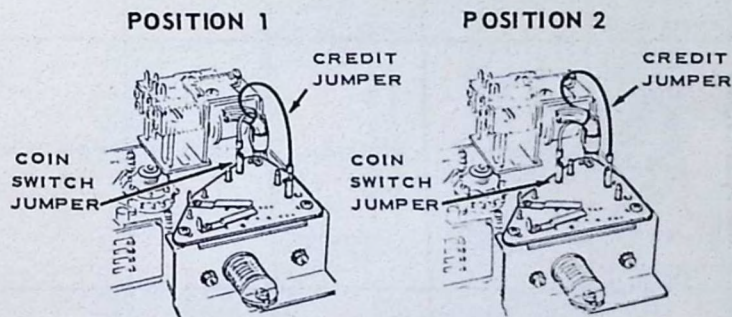


Figure 15. Coin Switch and Credit Jumpers.

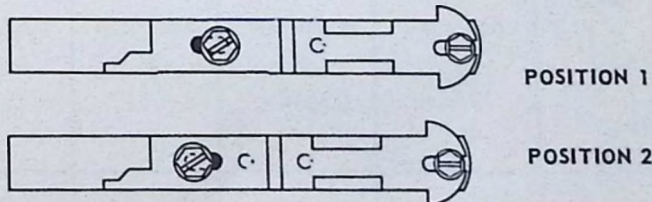


Figure 16. Subtract Plate Positions.

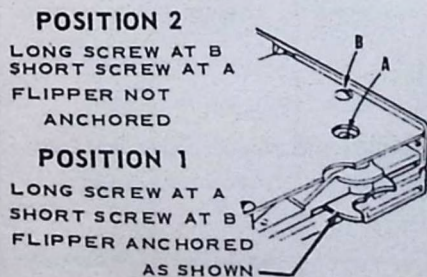


Figure 17. Slug Receptor Adjustment.

Adjusting the Pricing Unit

1. Connect the Single Credit Position Jumper (grey) as required, see *Figure 15*.
2. Connect the Coin Switch Jumper (red-white) as required, see *Figure 15*.
3. Remove the contact spring retaining screws and place the contact pins in their required positions. Replace contact springs and tighten in position.
4. Adjust the Credit Ratchet Wheels to the required settings as follows:
 - a. Turn the ratchet wheel assembly to the maximum clockwise position. This places all three ratchet wheels in zero credit position.
 - b. Lift and turn the 10¢ ratchet wheel (the middle wheel) to the number shown in the Pricing Chart (*Figure 18*). The peak of the tooth on the 10¢ add pawl should be in line with the peak of the first number in the group of credit per coin indicating numbers (when counting clockwise) on the ratchet wheel.
 - c. With the 10¢ ratchet wheel adjusted, lift and turn the 25¢ ratchet wheel to the number shown in the pricing chart. The peak of the tooth on the 25¢ add pawl should be in line with the peak of the first number in the group of credit per coin indicating numbers (when counting clockwise) on the ratchet wheel.

5. To adjust the Subtract Adjustment Plate, first loosen the adjustment screw. The screw can be reached when the Cancel Slide is pushed in. Adjust the plate to Position 1 or Position 2 as required, see *Figure 16*. Tighten screw.

Adjusting the Slug Receptor

Remove the slug receptor from the Consolette and set the flipper to Position 1 or Position 2 as required. See *Figure 17*.

STEREO CONSOLETTTE, Type SC1

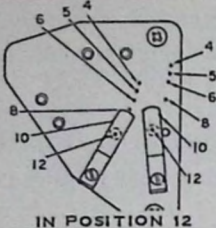
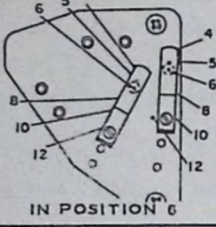
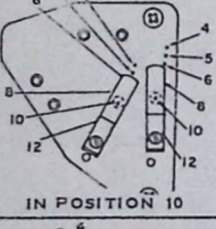
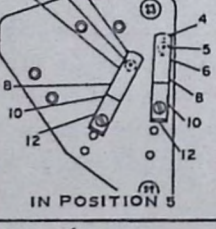
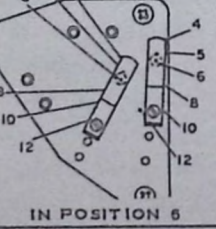
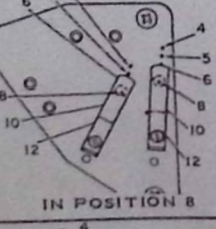
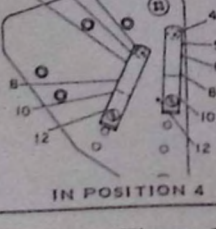
NUMBERS	PRICING WINDOW, SINGLE PRICING & ALBUM PRICING INFORMATION	ALBUM CREDIT CONTACT PIN POSITIONS	CREDIT RATCHET WHEEL POSITIONS		SUBTRACT ADJUSTMENT PLATE POSITION	SINGLE CREDIT JUMPER POSITION	COIN SWITCH JUMPER POSITION	SLUG REJECTOR
			DIMES	QUARTERS				
1	singles 10¢ per selection QUARTER 3 selections albums: 2 QUARTERS	 IN POSITION 12	 POSITION 2	 POSITION 6	POSITION 2	POSITION 2	POSITION 2	POSITION 1
2	singles: 10¢ per selection QUARTER 3 selections albums: 1 QUARTER	 IN POSITION 6	 POSITION 2	 POSITION 6	POSITION 2	POSITION 2	POSITION 2	POSITION 1
3	singles: 10¢ per selection QUARTER 5 selections albums: 2 QUARTERS	 IN POSITION 10	NOT USED	 POSITION 5	POSITION 1	POSITION 1	POSITION 1	POSITION 2
4	singles: 10¢ per selection QUARTER 5 selections albums: 1 QUARTER	 IN POSITION 5	NOT USED	 POSITION 5	POSITION 1	POSITION 1	POSITION 1	POSITION 2
5	singles: 5¢ per selection QUARTER 6 selections albums: 1 QUARTER	 IN POSITION 6	 POSITION 2	 POSITION 6	POSITION 1	POSITION 1	POSITION 2	POSITION 1
6	singles: 10¢ per selection QUARTER 4 selections albums: 2 QUARTERS	 IN POSITION 8	NOT USED	 POSITION 4	POSITION 1	POSITION 1	POSITION 1	POSITION 2
7	singles: 10¢ per selection QUARTER 4 selections albums: 1 QUARTER	 IN POSITION 4	NOT USED	 POSITION 4	POSITION 1	POSITION 1	POSITION 1	POSITION 2

Figure 18. Album Pricing Unit Adjustment Chart.

PHONOGRAPH AUDIO POWER CONSIDERATION

In locations where the Stereo Consolette has been installed close to the phonograph, adjustments should be made at the amplifier to reduce phonograph speaker power. Excessive output from the phonograph speakers will override and negate the sound emanating from the stereo speakers in the Consolette. As low as a 2-

watt phonograph speaker setting may be required, however, the total amplifier load should not be less than 6 watts.

Refer to the LPC Installation Manual, Part No. 487390 for typical system installation using Stereo Consolettes. Note that total amplifier loading must not exceed 25 watts per channel.

INSTALLATION OF TERMINAL BOARD COVER, CABLE CHANNEL & BOTTOM HOLE COVER

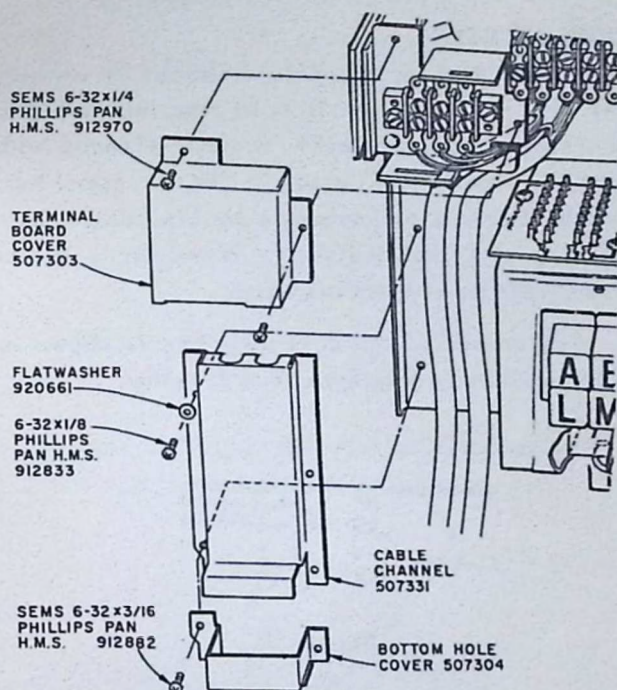


Figure 19.

The above illustration shows the placement and installation of the Terminal Board Cover, Cable Channel and Bottom Hole Cover as required in the Stereo Consolette, Type SC1, and detailed in the Manual Section titled "Wiring the Consolette", paragraphs 1 through 5.

REMOVAL & INSTALLATION OF APU10

TO REMOVE APU10

1. Rotate Contact Wiper Arm on Motor Assembly to position shown in Fig. 1.
2. Disconnect the 12 contact plug.
3. Remove mounting screws. (Fig. 4).
4. Pull unit forward until free of locating pins on SC1 backplate, lift on right side turning right side outward while lifting. CAUTION do not touch Coin Switch!



Fig. 1.

TO INSTALL APU10

1. Rotate Contact Wiper Arm to position shown in Fig. 1.
2. Pull Return Lever on Motor Assembly away from SC1 Back Plate. (Fig. 3).
3. Reverse step 4 removal procedure. Be sure Pawl Pin on Cancel Slide is between Return Lever and SC1 Back Plate. (Fig. 3).
4. Start the mounting screws. Make sure to use flatwashers if they were used previously.
5. Rotate Contact Wiper Arm to Credit Position. (Fig. 2).
6. To get proper Cancel Slide "end play" clearance of $\frac{1}{32} \pm \frac{1}{64}$ slide APU10 backward or forward. This is IMPORTANT for unit to subtract properly. (Fig. 4) SEE NOTE BELOW.
7. Tighten screws, recheck "end play", and insert plug.



Fig. 2.

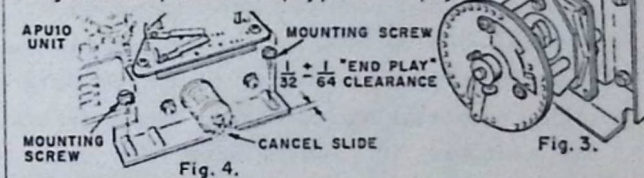


Fig. 3.

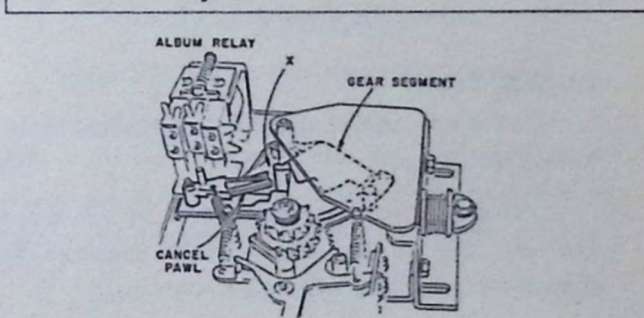
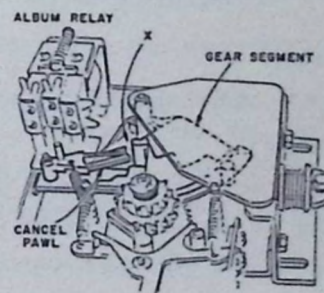


Fig. 4.



NOTE: TO AVOID BINDS, CHECK ADJUSTMENT AND ASSURE CORRECT SUBTRACT FUNCTION. ESTABLISH THIRTEEN (13) CREDITS AND, WITH ALBUM RELAY IN ENERGIZED POSITION, CHECK FOR CLEARANCE BETWEEN CANCEL PAWL AND GEAR SEGMENT AT POINT "X"; SEE ILLUSTRATION ABOVE.

MAINTENANCE AND SERVICE

CLEANING

The slug rejector should be kept free of dirt and dust. If a rejector has been working successfully and becomes erratic or fails to work at all, the trouble can generally be attributed to dirt or to some stoppage in the coin track. Cleaning only should correct the trouble.

Switch and relay contacts should be cleaned with a contact burnisher. Do not use a file, sandpaper, or emery cloth.

The contacts on the selector disc should be cleaned with a cloth saturated with carbon-tetrachloride. Do not use emery cloth or sandpaper. The contacts are silver plated brass. To sand them or clean them with an abrasive will remove the plating and expose the brass. The brass does not provide good contact and will require more frequent service as well as cause erratic operation. The contacts should not be lubricated.

The contact point on the contact arm should be cleaned with carbon-tet'. It is not necessary to remove it from the shaft. A piece of cloth saturated with carbon-tet' can be drawn under the contact point.

The selector switches should be kept free of dirt and dust by blowing out. Do not use roach powders of any kind. Most of the powders are highly corrosive and will soon cause failure of the switches. If powders have been used, the switches should be thoroughly cleaned.

LUBRICATION

The motor cams should be lubricated with Aero Lubriplate.

A drop or two of Seeburg No. 53014 Special Purpose Oil on the Motor Shaft bearings will reduce wear and friction to a minimum.

The scavenger linkage of the slug rejector can be sparingly lubricated with No. 105 Lubriplate at wear and friction points, but care should be taken so that it does not get into the coin track. Oil should not be used. The coin path of the rejector may be dusted with Motor Mica.

MOTOR

The motor is designed to operate the Consolette through a complete cycle in a little more

than 2 seconds. If the motor is slow, the current impulses to the step relay (in the Remote Control Stepper Unit) will be slow and cause erratic operation of the step switch assembly. The motor can best be checked for speed by allowing it to operate steadily and counting the turns per minute of the contact arm. Normal speed is 20 revolutions per minute. Acceptable speed limits are 19.5 to 21 rpm. If the motor is slow, check for binding or excessive friction. If the motor runs slow when there are no binds, it will have to be replaced.

COIN SWITCHES

If operation of the coin switches is erratic, the slug rejector must first be removed and then the coin switch contacts carefully cleaned with carbon-tetrachloride using a No. 2 camel hair brush. Burnish the contacts by inserting a burnishing tool between them. *Never use a file or sandpaper for contact cleaning.*

Adjustment of the coin switches is shown in Figure 20 and paragraphs A to D below.

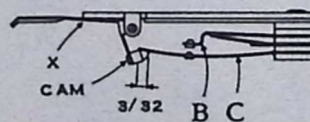


Figure 20.

- A. Adjust the coin levers so they are parallel with the bottom edge of the rejector when bearing against switch bracket at "X".
- B. Adjust short blade and bracer for $1/32''$ to $3/64''$ contact gap (all switches) with short blade bearing against tip of bracer approximately 1 to 3 grams (measured at contact point).
- C. Adjust the long blade so it bears against the cam, as measured at the switch contact.
 1. Nickel switch (front) - 8 to 10 grams
 2. Dime switch (middle) - 6 to 8 grams
 3. Quarter switch (back) - 8 to 10 grams
- D. Adjust the switch actuating cams to be tilted as shown and overlap the switch blade approximately $3/32''$.

CONTACT WIPER ARM POSITION

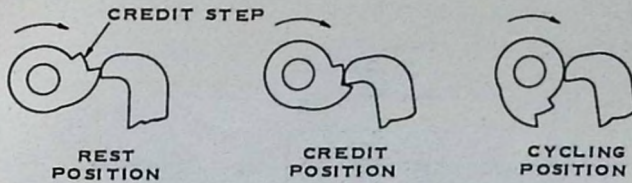


Figure 21. Cam Positions.

1. Turn the motor manually until the latch bar lever drops to the credit step of the cam and then reverse the direction until the point of the lever is against the vertical part of the cam as shown in Figure 21 above.

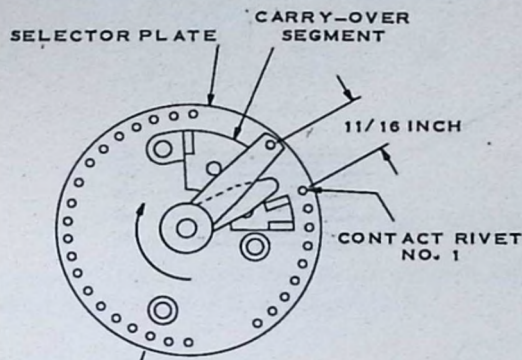


Figure 22. Wiper Arm Radial Adjustment.

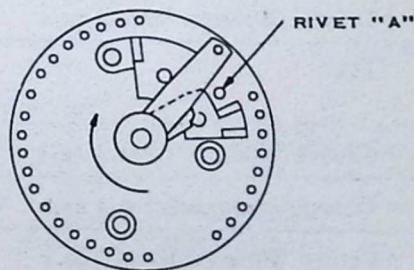


Figure 23. Rivet "A" Position.

2. Set the contact arm on the shaft so that center of outermost contact of the arm is approximately $11/16$ " away from the center of the first contact on selector plate, see Figure 22.

Innermost contact of wiper arm should be contacting rivet "A" on selector plate, see Figure 23.

3. Inner blade of the wiper arm is set so that it is approximately $3/32$ " from the surface of the selector plate as shown in Figure 24. Force "F" of outer contact must be from $1\frac{3}{4}$ to $2\frac{3}{4}$ ounces.

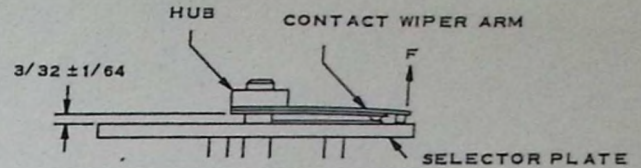


Figure 24. Wiper Arm Lateral Adjustment.

LATCH BAR ADJUSTMENT

The selection switches have three conditions of operation corresponding to the 3-positions of the cam shown in Figure 21 and are operated by the cam through mechanical linkage. In the stand-by positions the switch latch bars are held against the pressure of the latch bar spring so the selector buttons are free to move in and out and will not stay in the pressed-in position. In the credit position the bars are released to a position which permits a selection switch, when pressed, to latch in the operated position but, if another switch is operated, the first will be released. In the cycling position the latch bars are fully released so the selection switches are locked in either the normal or pressed positions.

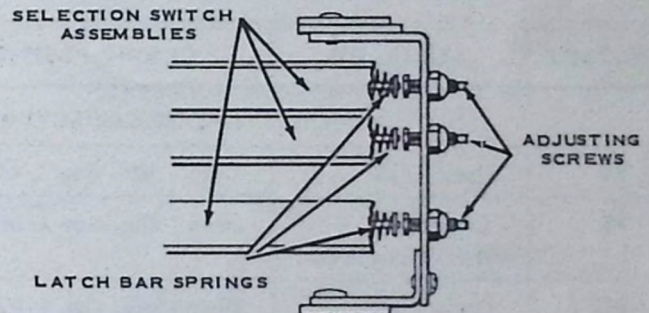


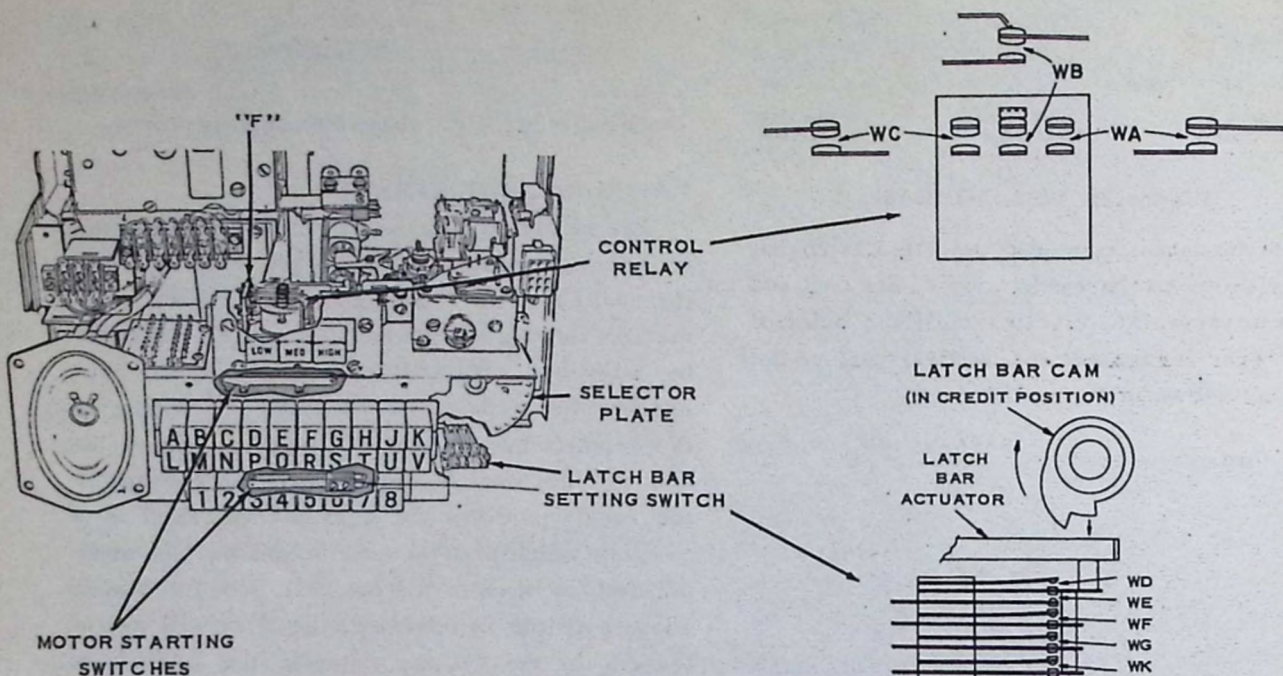
Figure 25. Latch Bar Adjusting Screws.

The adjustment for the latch bar operation is made with the screws - one for each selection switch assembly - at the right of the assemblies (shown in Figure 25) in the following manner:

1. Place the cam in the Credit Position (Figure 21).
2. Turn the adjusting screws until the selection switch shafts strike the latch bars, but do not latch in the pressed-in position.
3. Back out the screws $\frac{1}{2}$ to $\frac{3}{4}$ turn.
4. Check for positive locking of the switches when the cam is in Cycling "position".
5. Check for full release and free in-and-out movement of the switches when the cam is in stand-by position.

STEREO CONSOLETTTE, Type SC1

CONTACT OPERATION & GAP ADJUSTMENT



CONTACT	STAND-BY	CREDIT POSITION	CYCLING (CREDIT-CANCEL)
LAT CH BAR SETTING SWITCH			
WD	Open 1/16	Open - Min. Gap 1/64	* Closed (Minimum force 1 oz.)
WE	Closed (Min. force 1 oz.)	Open - Min. Gap 1/64	† Open
WF	Open 1/16	Open - Min. Gap 1/32	* Closed (Minimum force 1 oz.)
WG	Open 1/16	Open - 1/32	* Closed (Minimum force 1 oz.)
WK	Open 1/16	Open - 1/32	* Closed (Minimum force 1 oz.)
* Contacts "WD", "WF", "WG", and "WK" close before innermost contact of wiper arm leaves carryover segment on selector plate assembly. (Figure 22)			
† Contacts "WD" remain closed until after innermost contact of wiper arm again reaches carryover segment on selector plate assembly. (Figure 22)			
MOTOR STARTING SWITCHES			
WH	The Motor Starting Switches should make contact at the bottom of the Selection Button Stroke. They should make contact as close as possible to the bottom and still maintain contact when any button on the Switch is latched in.		
WJ			
CONTROL RELAY			
WA	All Contacts Normally Open -- Minimum Gap 1/64 -- Minimum Force 1 oz. Pressure required to Start From Rest Position Measured at "F" is 2 oz. Coil Resistance is 33 Ohms ±10%.		
WB			
WC			

STEREO CONSOLETTTE, Type SC1

ALBUM PRICING UNIT, Type APU10-56

- ADD ADJUSTMENTS -

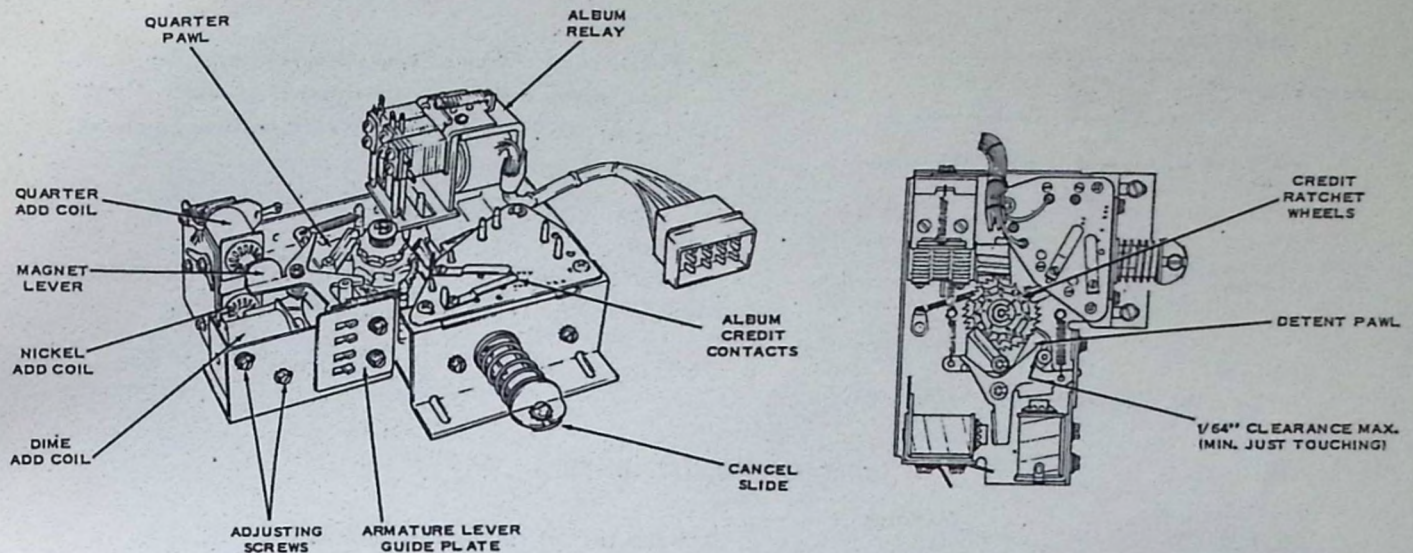
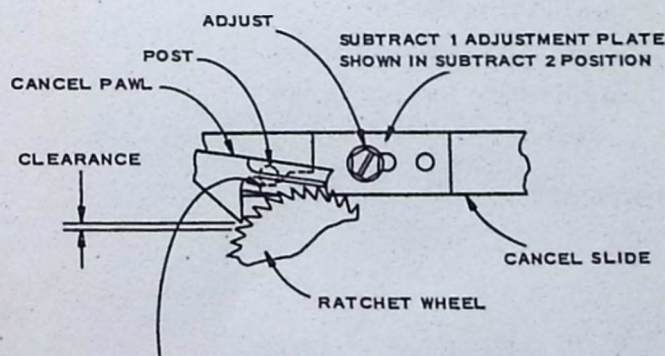


Figure 26. Component Identification.

1. Make certain that Ratchet Wheels are aligned with one another for 10¢ Add 2 and 25¢ Add 6.
2. Adjust all add coils so that the Detent Pawl is lifted out and clears periphery of Nickel Ratchet Wheel by 1/32 inch when Magnet Lever is seated on pole piece.
3. Adjust Armature Lever Guide Plate so that 1/64" clearance maximum (minimum just touching) exists between post on detent lever and all three (3) Magnet Levers. This is with cancel slide in Stand-by (depressed) position.
4. The three (3) Detent Pawls must each clear the teeth on their associated Ratchet Wheel. Re-adjust Armature Lever as required.

- SUBTRACT ADJUSTMENTS -



POST ON CANCEL PAWL MUST BE BEARING SLIGHTLY AGAINST THIS EDGE OF ADJUSTMENT PLATE AS PAWL ENTERS BRACKET, PART NO. 451565, AS REQUIRED TO MEET THIS REQUIREMENT.

Figure 27. Cancel Pawl Entry.

1. Adjust Subtract 1 Adjustment Plate for Subtract 2 and check entry of Cancel Pawl into ratchet teeth.
2. Establish eight (8) credits on Ratchet Wheel and adjust Slide Stop Bracket to allow return stroke of Cancel Slide to return Ratchet Wheel two (2) teeth.

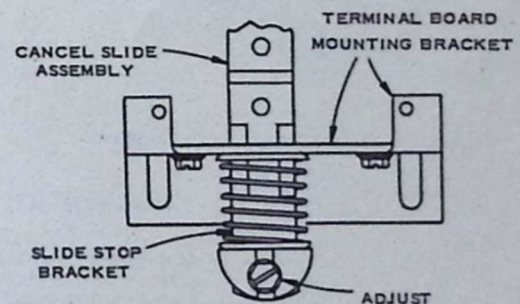


Figure 28. Slide Stop Bracket Adjustment.

3. Re-adjust Slide Stop Bracket slightly for over-travel as shown in Figure 29.

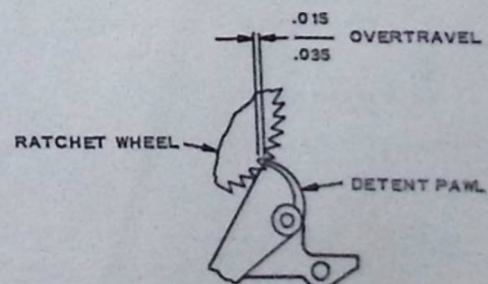


Figure 29. Over-travel Adjustment.

STEREO CONSOLETTTE, Type SC1

ALBUM PRICING UNIT, Type APU10-56

- SUBTRACT ADJUSTMENTS CONTINUED -

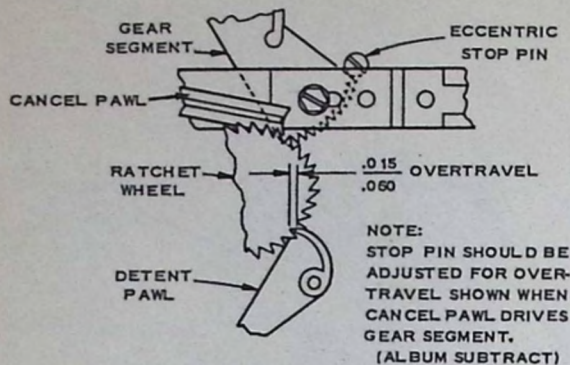


Figure 30. Album Subtract Adjustment.

4. Position of Album Relay Bracket must be such that when relay is energized, Cancel Pawl (Figure 30) is in position to pick up Gear Segment to cancel all credits.

NOTE:

IF RELAY BRACKET IS RE-ADJUSTED, RECHECK REQUIREMENTS OF PARAGRAPH NO. 1.

- CONTACT ADJUSTMENTS -

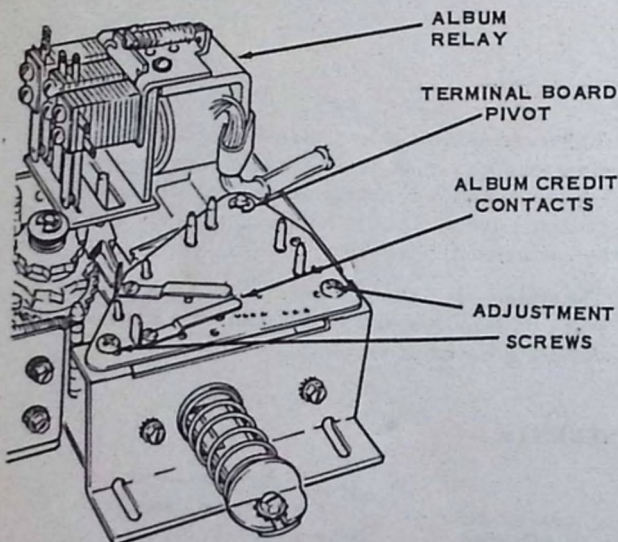
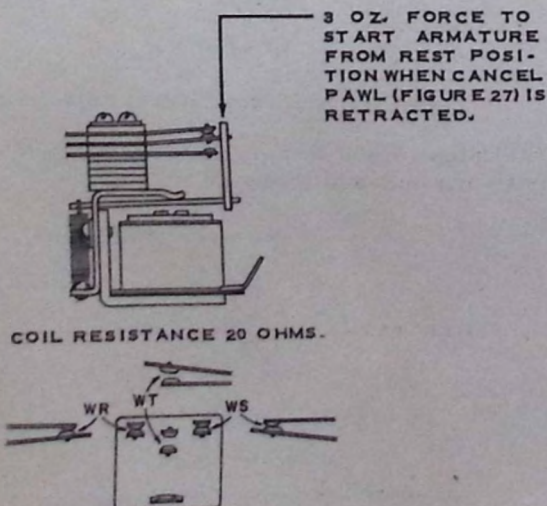


Figure 31. Component Identification.

(Refer to APU10-56 schematic on Page 12131.)

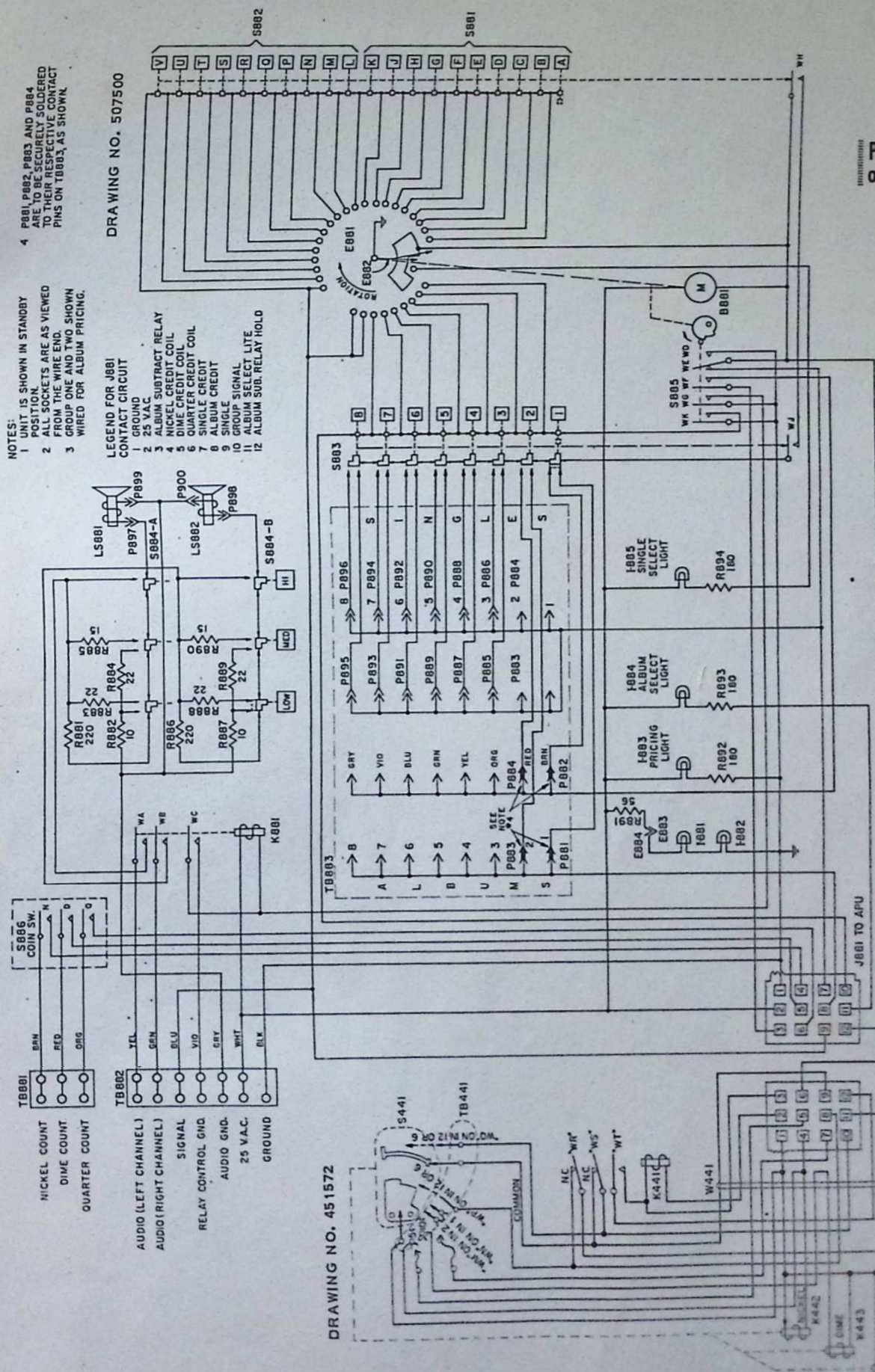
1. Contact pins and springs (Contact "WP" and "WQ") should be "ON in 12" position. Pins should bear against contact segment and plate with 1 oz. pressure.
2. Contact springs (2 commons and "WM" and "WN") must bear against segment on plate with 1 oz. pressure.
3. Adjust by loosening adjustment screws (Figure 31) and positioning terminal board to meet the following requirements:
 Contact "WN" - On in 1 credit
 Contact "WM" - On in 2 credits
 (continuity to P441 Pin 1)
 Contact "WP" - On in 12 credits
 Contact "WQ" - On in 12 credits
 (continuity to P441 Pin 9)

- ALBUM RELAY ADJUSTMENTS -



Contacts "WR" and "WS" normally closed with 1 oz. minimum pressure. Contact "WT" normally open with 1/64 inch minimum gap. When relay is energized, contact "WT" closes with 1 oz. minimum pressure and "WR" and "WS" open with 1/64 inch minimum gap.

STEREO CONSOLETTTE, Type SC1



PARTS LIST
on Reverse Side

STEREO CONSOLETTTE, TYPE SC1.

ALBUM PRICING UNIT, TYPE APU10-56

STEREO CONSOLETTTE, Type SC1

Parts List for Album Pricing Unit, Type APU10-56

Parts List for Stereo Consolette, Type SC1

Item	Part No.	Description
K441	451566	Album Relay
K442	451546	Nickel Credit Coil Assembly
K443	451549	Dime Credit Coil Assembly
K444	451546	Quarter Credit Coil Assembly
P441	307048	12 Contact Plug
S441	451518	Gear Segment Assembly
TB441	451552	Terminal Board Assembly
W441	451569	Cable Assembly

Item	Part No.	Description	Item	Part No.	Description
B881	507311	Motor Assembly	R881	81234	220 Ohm 2 W. $\pm 10\%$
E881	507347	Selector Plate Assembly	R882	82400	10 Ohm $\frac{1}{2}$ W. $\pm 10\%$
E882	507733	Contact Wiper Arm Assembly	R883	81230	22 Ohm 2 W. $\pm 10\%$
E883	507514	Brush Assembly	R884	82404	22 Ohm $\frac{1}{2}$ W. $\pm 10\%$
E884	507448	Contact Assembly	R885	82402	15 Ohm $\frac{1}{2}$ W. $\pm 10\%$
I881	507522	No. 19 Lamp	R886	81234	220 Ohm 2 W. $\pm 10\%$
I882	507522	No. 19 Lamp	R887	82400	10 Ohm $\frac{1}{2}$ W. $\pm 10\%$
I883	507522	No. 19 Lamp	R888	81230	22 Ohm 2 W. $\pm 10\%$
I884	507522	No. 19 Lamp	R889	82404	22 Ohm $\frac{1}{2}$ W. $\pm 10\%$
I885	507522	No. 19 Lamp	R890	82402	15 Ohm $\frac{1}{2}$ W. $\pm 10\%$
J881	307153	12 Contact Socket	R891	81235	56 Ohm 2 W. $\pm 10\%$
K881	507795	Control Relay	R892	81232	180 Ohm 5 W. $\pm 10\%$
LS881	507370	Speaker	R893	81232	180 Ohm 5 W. $\pm 10\%$
LS882	507370	Speaker	R894	81232	180 Ohm 5 W. $\pm 10\%$
P881 Thru P896	132054	Receptacle	S881	507351	Top Selector Switch
P897	941785	Receptacle	S882	507352	Center Selector Switch
P898	941785	Receptacle	S883	507353	Bottom Selector Switch
P899	941776	Receptacle	S884A	507366	Control Switch
P900	941776	Receptacle	S884B	507366	Control Switch
			S885	507794	Latch Bar Setting Switch
			S886	507326	Coin Switch
			TB881	505958	3 Lug Terminal Board
			TB882	507521	6 Lug Terminal Board
			TB883	507360	Terminal Board Assembly